Gleanings in Bee Culture

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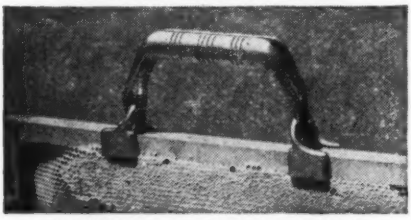

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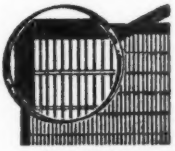

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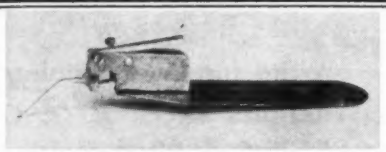

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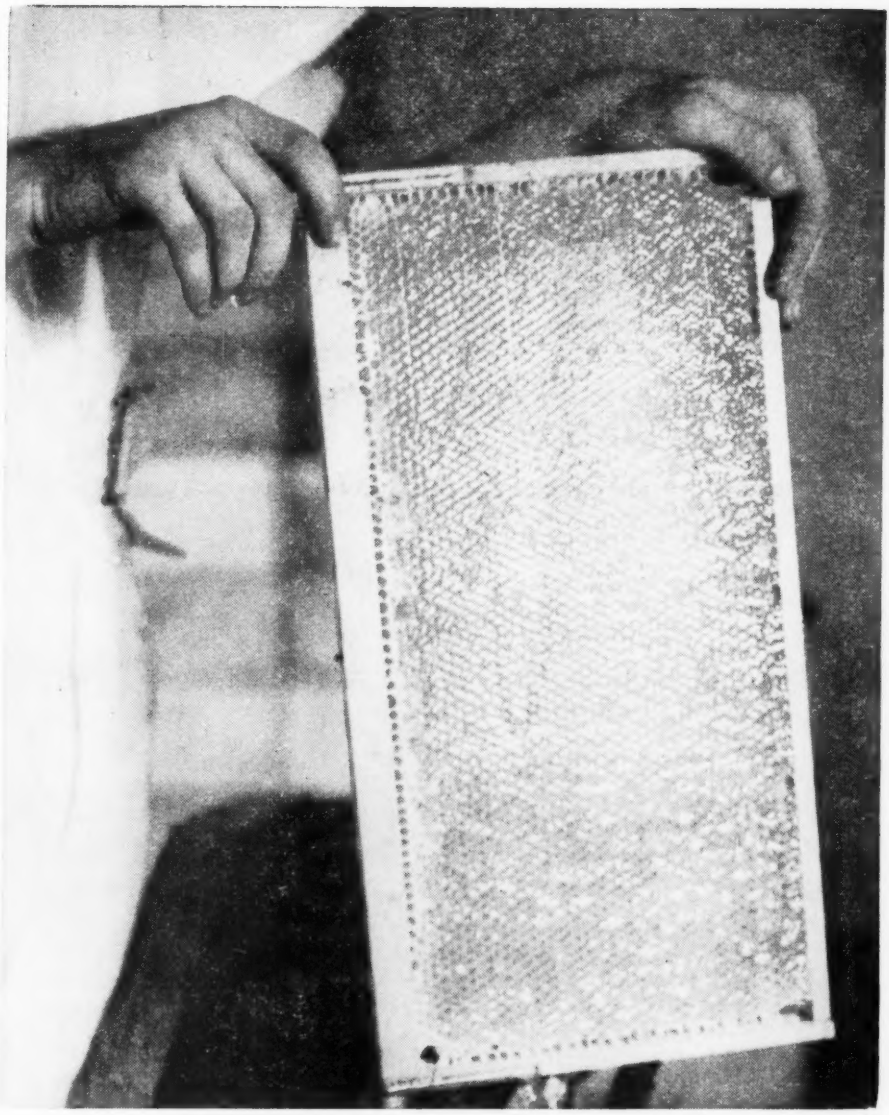

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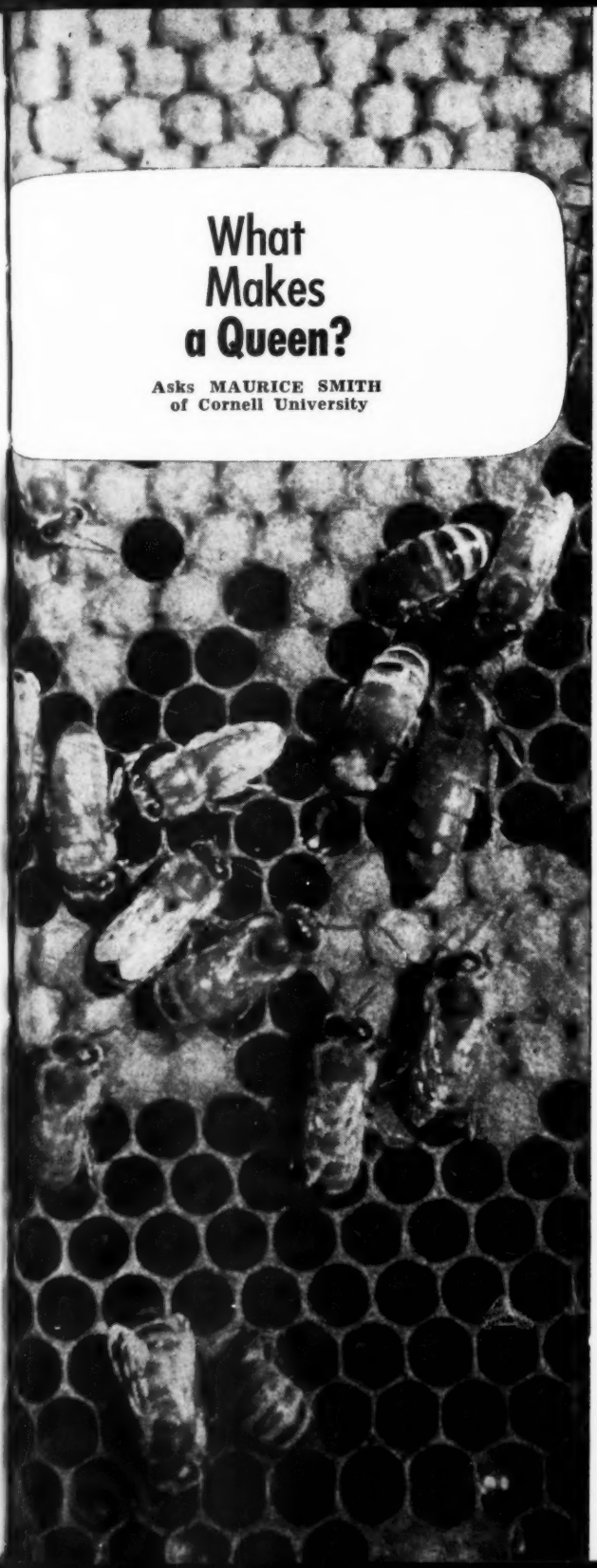
What Makes a Queen?

Asks MAURICE SMITH
of Cornell University



Why is it So Difficult to Rear Queens Artificially?

FOR YEARS alchemists searched in vain for a method of transferring base metals into gold. Yet a transformation which is almost as amazing is performed quite commonly in the honeybee colony. The raw material, in this case, is a very ordinary worker larva. When the honeybee alchemists so decree, this larva may be transformed into a royal queen bee.

Honeybees do not hold exclusive rights to this process, however. Certain other social insects, including ants, termites, wasps, and bumblebees, are similarly able to develop queens from worker larvae when the need arises. But since the honeybee colony is so readily accessible and easily observed, it is with this insect that most investigations have been carried out.

In the hive honeybees bring about queen transformation by selecting a worker larva at an early age — usually less than three days old—and feeding it lavishly on a rich glandular secretion known as royal jelly. They con-

struct around the chosen larva an enlarged queen cell, which is suspended in a vertical position in contrast to the horizontal position of the worker cells. After making certain that the growing larva has an abundant supply of food, the hive bees seal over the queen cell a full day sooner than if the larva had remained a worker. Sixteen days after the egg was laid, and five full days ahead of her worker sisters, the perfectly formed queen emerges. It all seems so simple and routine an accomplishment the way the bees do it, yet the secret of this transformation has for years defied solution.

The phenomenon of queen differentiation has fired the imagination of many an investigator, and numerous attempts have been made to gain a better knowledge of the nature of queen development. On various occasions in the past small worker larvae have been removed from the hive and hand-reared successfully to the adult stage. But even when the larvae were placed in enlarged cells and fed on fresh royal jelly from natural queen cells, only worker honeybees were produced. The consistent failure to hand-rear queen bees outside the environment of the hive led to the assumption that royal jelly alone was not sufficient for queen differentiation and pointed to the possibility that some direct contact between the nurse bees and queen larvae was necessary.

Dr. Nevin Weaver has recently confounded this theory by successfully rearing in the laboratory adults which were queen-like in all respects. He was, however, only able to rear queens from fresh royal jelly. From jelly refrigerated for one to four weeks he obtained adults intermediate between queens and workers, and from jelly stored for one year most of the individuals reared were essentially worker-like. These results led him to conclude that royal jelly contained some highly labile factor which was essential for queen differentiation. A full account of his work appeared in Science, Vol. 121 (April 8, 1955).

Using similar techniques further work on this problem was carried out this summer at the Ontario Agricultural College in Guelph. Tiny worker larvae just hatched from the egg were transferred to watch glasses containing royal jelly. These were placed in an incubator and maintained at a temperature of 94°F. and a relative humidity of 95%. This high humidity was found necessary to keep the jelly and the small larvae from drying out. Once each 24 hours the larvae were transferred to a fresh dish of jelly.

After the larvae ceased feeding they were transferred to clean glass dishes and allowed to pupate. A number of larvae failed to pupate successfully, and the highest mortality occurred at this stage. However, some pupated normally and went on to develop into adults. A total of 33 females that were essentially queen-like, and eight intermediate forms that were predominately worker-like, were reared. Most of the above queens were obtained from larvae fed on fresh royal jelly, although several were reared from jelly which had been stored at 0°F. for 13 months.

The developmental period for the queens reared in these experiments was increased by an average of about three days. This, coupled with the high mortality at pupation and the production of intermediate forms, indicates that the present artificial rearing technique is still far from perfect. We must still concede that the secret formula employed by the nurse bees in the hive yields superior results.

Is a queen reared in an incubator under such artificial conditions a true functional queen in all respects? To clarify this point two particularly vigorous queens that emerged in the incubator on July 20th were introduced to mating nuclei in the bee yard. Both were marked before introduction so there could be no mistake in their identity. One queen disappeared six days later (possibly lost on a mating flight) but the other queen mated successfully and began laying on August 3rd. Three weeks later normal workers were observed emerging. When last examined on September 9th this queen

(Continued on page 186)

Maurice Smith has successfully reared fully developed queens in the laboratory.

PACKAGE BEES for Honey and Pollination

by CHAS. A. REESE*

PRODUCTION OF package bees is a branch of the beekeeping industry developed in the Gulf States and sections of California, because colonies there reach normal strength several weeks before those in the North. This offers a convenient source of bees for the beginner, replacing winter losses, making increases, strengthening weak colonies, and supplying bees for the pollination of deciduous fruits and certain vegetables grown under glass.

Package Types

Such bees are available in two types of packages—combless and with comb. The combless package is the most popular because of its adaptability to meet most conditions. Packages contain two, three, or five pounds of bees confined in a screened wooden shipping cage with a food container of sugar syrup. The queen usually is placed in a standard mailing cage and suspended in the center of the package. Three-pound packages generally are recommended. Five-pound packages are used largely for pollination purposes in the deciduous fruit industry.

All shipping cages are of standard dimensions so they may be placed within a regular hive-body. The top, ends, and base are wood with the sides covered with wire screen. Thin wooden slats sometimes are inserted diagonally to provide support for clustering. A No. 3 tin can containing syrup is inverted and suspended in the top of the cage. This furnishes food through several tiny holes in the lid for the bees while in transit. When packages are transported by air the feeder-can is eliminated.

Ordering Package Bees

It is a two-fold advantage to order package bees several weeks before the desired date of arrival. Then the purchaser is reasonably sure of receiving the bees promptly. Shippers also are in a position to provide prompt service and better values by carefully planning operations. The ideal time for receiving and installing packages is at the beginning of the fruit or dandelion bloom. Then there usually is an abundance of pollen and nectar available, which enables the bees to start brood-rearing with little delay. Research and observations indicate that it requires approximately ten weeks for a three-pound package to reach a population of maximum strength for production of surplus honey.

Preparation and Care Upon Arrival

Since it is essential to install the bees with the least possible delay, definite preparations should be made well in advance. Inform the local express

Bees gorged with sugar syrup form a quiet cluster. — Ohio State Univ. photo.

* Ohio Extension Apiarist

Examining the queen to determine her condition. —Ohio State Univ. photo.

agent of the shipment and request immediate notification of arrival. Inform him of the necessity of placing the bees in a cool, dark place until they are claimed. If the bees are extremely active or restless, they should be given water or a thin syrup. Sprinkle or spray this directly into the cage and repeat until the cluster forms a rather compact mass. Then, until installation, place the bees in a cool, dark room or basement where the temperature is 55 to 60°F. Having the hives on location and materials in readiness eliminates confusion and expedites installation.

When bees are installed on drawn combs, or in hives which were previously occupied, it is necessary to be certain that the colony is not infected with American foulbrood. Otherwise this will mean the loss of the bees. Hives with combs containing a liberal quantity of pollen with two or three frames of honey are ideal for the introduction of package bees. If drawn combs are not available, frames with full sheets of foundation may be substituted. When the weather is cool the installation may be done at any period of the day; otherwise, the best time is late in the afternoon or early evening.

An hour before installation, transfer the cage to a location where the temperature is about 70°F., and feed the bees a sugar syrup of equal parts granulated sugar and water. The ideal procedure is to sprinkle or spray the syrup directly on the bees until they appear rather wet or form a quiet, compact cluster. In this condition, they are less likely to fly, besides having time to become organized after installation. It is necessary to reduce the hive entrance to at least ⅜ x 1 inch.

Installing the Bees

Since the introduction of package bees to the industry, many procedures have been suggested regarding the proper means of transferring the bees to modern hives. Probably the easiest method is to place the package within the hive and permit the bees to move directly onto the combs. This can be accomplished with little confusion and drifting of the bees by removing four frames from one side of the hive and setting the prepared package in the vacant space. Then pry off the cover of the bee shipping cage, lift out the feeder can, and pull out the small rectangular wooden cage containing the queen. This usually is attached to a wire, which has been tacked to the top of the package under the cover.

Carefully examine the queen to determine her condition. The end compartment containing the candy is covered either with heavy paper or occasionally with a small piece of metal. This is removed and a small hole about the size of a match stick is punched through the candy. The queen cage

with the candy end up can be suspended between the second and third frames opposite the opening of the package. If the weather is cool (40 to 50°F.) and there are indications that temperatures may continue so for a few days, the queen cage should be suspended next to the package.

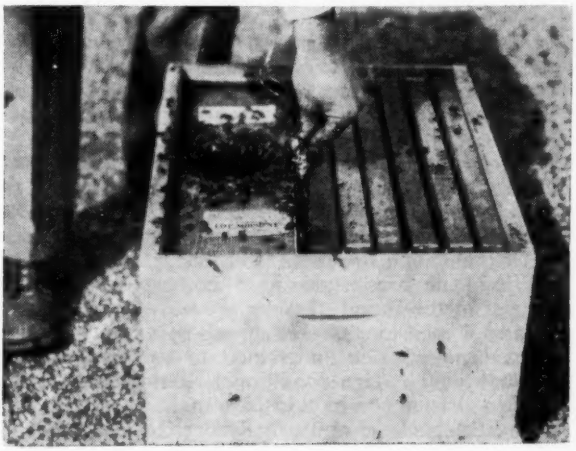
Some operators prefer to lay the queen cage with the screen side down on the top-bars between the second and third frames directly opposite the opening of the package.

It is well to dip out the equivalent of two or three handfuls of bees over the cage, to attract the bees from the package to the cage containing the queen and give her protection. The inner-cover is replaced with the rim side down. A "pepper box" feeder of warm syrup is inverted over the opening of the inner-cover. This is surrounded with an empty hive-body covered with the outer-cover. The "pepper box" feeder consists of a five- or preferably ten-pound friction-top pail filled with syrup of equal parts of granulated sugar and water. The syrup should be brought to a boil and allowed to cool to about 90°F. before it is placed over the bees. Six to a dozen holes, about the size of a No. 3 shingle nail, are punched through the lid. It is necessary to replace this lid securely before it is inverted—in which position the food will be accessible to the bees.

More experienced beekeepers may prefer to install the bees directly from the package into the hive. This is accomplished by removing eight frames from the center of the hive. Bees in the package are sprayed with a thin syrup until they appear quite wet. Then remove the feeder-can and queen and jar the bees to one end of the package. Cut the screen at the opposite end to permit quick shaking of the bees into the vacant space on the bottom board. Spread out the bees and replace the frames. The cage containing the queen is given the same treatment, as mentioned in the preceding method of transferring, and suspended in the central area of the hive. The inner-cover is replaced and the feeder applied as previously described. After the bees have been installed either on foundation or drawn comb, it is necessary to keep a constant supply of syrup in the feeder until nectar and pollen are available in the field.

Care of the Package Colony

Six days after installation, examine the colony to determine its condition. If the package was placed inside the hive it should be removed. Then push the frames to the center of the hive and fill in the empty space with frames of full sheets or drawn combs. Carefully check the combs, where the cluster has become established, to determine if the queen has started egg-laying. If eggs are present and deposited in a regular compact manner, the queen is in normal condition, and brood-rearing will progress quite rapidly. If no eggs are present, it indicates one of several conditions. If the queen has not been released, slightly enlarge the hole in the candy and replace the



Correct position of queen cage during cold weather.

cage in the same direction. If the queen has been liberated, it is possible she has not yet started egg-laying; or she may have been injured or was not accepted. Close the hive and examine for eggs four or five days later. If none are present, it is a fair indication the queen is either disabled or dead. In either case, a new queen should be ordered at once. Usually, shippers will replace injured, dead, or inferior queens such as drone layers.

About two weeks after installation, it is well to make a check on the condition of the first brood. If the surface of the cappings is rather even with each cell just slightly raised, the queen is normal. If cappings over the cells show an unevenness, appear bullet-shaped, or have a pronounced convex form, the queen was improperly mated and is laying unfertile eggs. Such queens should be destroyed and replaced with a new queen.

The critical period in the progress of the package usually occurs about three weeks after it has been installed. Then the adult bee populaton is at its lowest ebb, and brood-rearing is at a relatively high point, placing the colony in a possible unbalanced condition. Frequently, at this period, the bees attempt to supersede the queen. Supersedure in package colonies is a problem often caused by inferior queens or frequent handling of the new co'ony.

In addition to providing a constant supply of syrup, it is a good practice to supply a pollen substitute. A good formula for preparation consists of one part brewers yeast—of the animal type—and four parts of expeller-process soybean flour moistened with a heavy sugar syrup—three to four parts of sugar to one part water. Thoroughly mix until it has the consistency of a medium stiff dough. Place a pound over the top-bars directly above the brood. Feed the substitute until natural pollen becomes available.

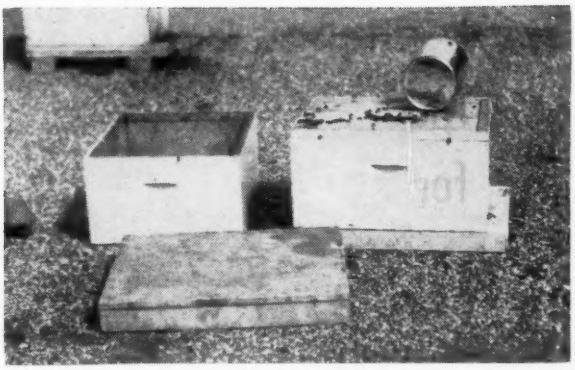
Sometimes when weather conditions are favorable for bee-flight and nectar secretion, the bees store it in combs adjacent to the brood, thereby preventing any expansion of the brood-nest and causing what is understood to be "honey bound". This condition is likely when drawn combs are used in installing the package and usually occurs during fruit or dandelion bloom. In order that the queen may have adequate comb space for egg laying, it is necessary to c o r r e c t this "honey bound" condition by interchanging the frames of honey with the empty combs or foundation next to the sides of the hive.

A common error by the beginner usually is the addition of the second hive-body too soon for the needs of the colony. This action retards rather than stimulates brood-rearing. Normally the colony does not require the second hive-body until the sixth or seventh week after installation, or when the bees cover most of the combs in the first hive-body. When adding the second hive-body, take two frames of brood from the lower body and place them in the center of the upper body. Push the remaining brood combs in the lower body to the center and fill the empty space with frames removed from the top hive body. This manipulation permits the queen to expand her egg-laying activities over a greater area and relieves any congestion which might occur if the brood was left in the single story. Later if most of the brood-rearing activity is in the second hive-body, they should be interchanged. When nectar is coming in q u i t e freely, a third hive-body should be added.

Replacing Winter-killed Colonies with Package Bees

Occasionally exceedingly heavy colony losses occur late in the winter or early spring because of adverse weather and other contributing factors that happened late in the preceding season. Such colonies may be replaced by package bees, thereby quickly restoring bee populations which otherwise normally would require several years. Even if a package colony should not produce as much honey as a good overwintered co'ony, it keeps equipment in production. Idle equipment is expensive. Besides, it deteriorates rapidly.

Generally such hives have honey and pollen in sufficient quantity for the immediate requirements of the bees. It is necessary to clean the hives thoroughly by brushing out the dead bees clinging to combs and removing all refuse from the bottom board. The entrance must be reduced to a small



Package colony in position to receive syrup from the friction top pail feeder inverted over bee escape opening; hive body and outer cover to be placed over inner cover of the colony.

opening and retained until a larger one is needed for free flight.

While there are many procedures for installing packages, the spray and the direct queen release method of package introduction are most economical for commercial beekeepers. Not only does it require less labor, but it also permits queens to begin egg-laying earlier than the ordinary cage release method. By this method, the bees in the package are sprayed at several intervals before installation. Eight combs are removed from the center of the hive to provide space for shaking the bees. Just before this operation, the bees are sprayed again with syrup until they appear quite wet to prevent flight. The cluster is jarred into one end of the cage and the screen is cut to allow a quick shaking into the hive. The queen is then sprayed with syrup and released with the bees by pulling the screen from the cage. Bees then are spread out on the bottom to allow replacing the frames without injury to the bees.

Some operators prefer releasing the queen directly onto the combs. The hive is covered and left for three or four days when they can be examined if they are manipulated with extreme care. Good vigorous queens usually begin to lay within 24 hours, and the new colony progresses rather rapidly. The principles of management for replacement of bees follow the same procedure as over-wintered colonies.

Strengthening Weak Over-wintered Colonies

Frequently in early spring there are colonies with a small worker population, but which appear normal in all other respects, having a well-balanced supply of pollen reserves, honey, adequate comb space for egg-laying, and a vigorous queen. Such colonies can be restored to normal producing units by adding a two- or three-pound package of queenless bees. Otherwise they may have to struggle to produce sufficient honey to meet their own needs.

Weak colonies are a liability rather than an asset. For best results, weak colonies should be strengthened during early April by introducing two pounds of queenless bees to each colony which covers approximately two to three frames of comb.

Queenless packages can be united easily by preparing both the colony and the package by spraying or sprinkling the bees rather liberally with sugar syrup. The inner-cover from the weak colony is removed, and the syrup is sprayed or sprinkled directly over the tops of the frames occupied by the bees until the bees appear quite wet. The inner-cover is replaced, and the bee escape hole is left open. The bees in the package are sprayed with syrup using care not to wet them too heavily. The lid is pried off the package, the feeder-can removed, and the cage is inverted with the opening over the hole in the inner-cover. An empty hive-body is placed over the inner-cover, and the hive closed with the outer cover. About 24 hours later, carefully remove the cage and the empty body. Examination of the colony should be delayed for a few days.

Managing Bees for the

Tulip Poplar Flow

by W. W. CLARKE, JR.

THE TULIP TREE (**Liriodendron tulipifera**) known as tulip poplar or yellow poplar is one of the most dependable early sources of nectar throughout a large area in the East. The fact that it is an early source of nectar, blooming usually in late April only three weeks after the last killing frost, makes it difficult to obtain the maximum crop. Most beekeepers do not have colonies in condition to gather nectar and in many cases the entire crop is used to produce brood.

The honey from tulip poplar has a dark red color with a strong, rather pleasing flavor which, when blended, finds a ready market both for the table and the baking trade, especially in areas where it is produced. Its color and flavor, plus the fact that it blooms early, make it a poor crop to store in sections. There is a reluctance on the part of the producers of comb honey to produce tulip poplar comb honey. As a rule, only light-colored honey should be stored in sections; buckwheat, of course, is an exception to this. Bees are slow to store honey in sections early in the spring because of weather conditions and weakness. However, comb honey producers would find it advantageous to build strong colonies early to store this honey in extracting supers; thereby, having their bees in shape for the crops which follow tulip poplar.

Producing Strong Colonies

The biggest problem seems to be how to make colonies strong in order to produce honey. The building of a strong colony starts in the fall of the year when it is necessary to provide an ample supply of winter stores (60 pounds or more) along with a young vigorous queen and some type of winter protection. In most of the tulip-poplar area, the only type of protection needed is a windbreak. It is a good practice to keep bees in two-story or, at the very least, one and one half-story hives. It has been suggested by one beekeeper that it is best to use three hive bodies for wintering. In this way there should be a good supply of honey and space for rearing plenty of brood to build a strong colony early for the tulip-poplar flow.

Where two-story colonies (with the second body completely filled with honey in the fall) are used, we usually find the bees have an adequate supply of food both for winter and early spring build-up. It has been found by many beekeepers that feeding in the early spring, usually about six weeks before the honey flow is expected, has been of some help in stimulating brood rearing. Sugar syrup seems to be of more value, in the stimulation of brood rearing, than dry granulated sugar, which is being widely used at the present time. Beekeepers, who believe in the use of drugs as a preventive for American foulbrood, would be wise to add one-half gram of sulfathiazole to each gallon of syrup fed. Where this has been done with care each spring and fall, little or no disease has been found.

It must be remembered that the

These honeybees are working on a blossom of tulip-poplar. This honey plant (Liriodendron tulipifera) is also called yellow poplar and tulip tree for the leaves resemble the shape of tulips. It ranges from southern New England west to southern Michigan, and south to the Gulf States.—Photo by R. L. Parker.

queen will usually confine her egg laying to the upper hive body in the early spring, in which case the hive bodies should be reversed. This provides additional space for both brood rearing and storage of very early honey and pollen. As soon as the bees are active in the spring, check them for food, disease, and laying queens. If the queen is in the upper hive body, reverse them to keep the colony growing. Feed at this time, using an inside feeder to help prevent robbing.

It is best to feed slowly, using small holes in the feeder, since in this way the food is used for rearing brood rather than as surplus stores. In checking the queen, observe the pattern of the brood. If it is solid and free of drone brood in worker cells, it may be assumed that she is a good queen. Very few beekeepers can select a good queen on her appearance alone.

Weak Colonies Treated in Several Ways

Probably the best thing to do is unite a weak colony with a strong one. Most beekeepers accomplish this by placing a single thickness of newspaper over the colony with the poor queen and setting the colony with the good queen on top. It is not absolutely necessary to kill the lower queen, although it may help, since it is usually the queen in the lower hive which is lost. Little is gained by uniting two weak colonies. If the uniting is done early, the colony should do well and produce tulip-poplar honey. If a greater number of colonies are desired later, they may be divided after the tulip flow so they will be ready for the summer and fall crops.

Another way to handle a weak colony, especially if it is headed by a good queen, is to exchange locations with a very populous colony which is likely to swarm. The weak colony will pick up field bees which it needs, and swarming will be prevented in the strong colony. To maintain a strong colony it is necessary to prevent swarming. Exchanging locations, as described above, is one method.

The Demaree system of moving brood up and giving more room for the queen to lay is another way to prevent swarming. Usually swarming can be prevented by making sure there is ample space at all times, both for storage of honey and brood rearing, as well as a young vigorous queen. Fall requeening is a big help in building good colonies. Supers should be added as needed, which is usually earlier than most beekeepers realize, to take advantage of any early honey and pollen from skunk cabbage, maple, willow, etc. More supers are added as the tulip poplar starts to bloom. In most cases, supers are added to the top of the colony. Top supering makes it possible to check the bees for space without disturbing them. Much honey is lost because of lack of equipment and not getting supers on in time, since the flow from tulip is short and very heavy.

A queen excluder may be used to restrict the queen to the bottom hive body. This is desirable since some queens will roam over the entire colony making it more difficult to remove honey. When the honey flow is very heavy, it is possible to omit the queen excluder by keeping the queen crowded into the hive body. This is accomplished by having the first super filled with honey. As a general rule, the queen will not cross the capped honey. A queen excluder may be used until the first super is filled.

Many beekeepers feel that the queen excluder retards the activity of the bees and reduces the crop. Beekeepers, who are interested in late crops, or increase in colonies, will be wise to allow the queen free access to all the space she will use. This will use more of the honey for brood rearing, but will also build a larger colony. This is of value where there is a good spring crop from clover which comes along shortly after the tulip-poplar flow.

Removing Surplus Honey

All properly cured honey from tulip poplar should be removed as soon as possible after the honey flow is over, allowing only enough honey to keep the colony growing. If this is not done, all the next crop will be darker in color and stronger in flavor as a result of the tulip honey. Although the flavor and color are very much appreciated in the area where it is produced,

(Continued on page 190)

Beekeeping in ARIZONA

The southern border of Arizona extends approximately 340 miles east and west adjoining Old Mexico. It is a semi-desert region of low average rainfall. The altitude varies from 137 feet above sea level on the western side to elevations over 6000 feet near the eastern side.

Two general types of beekeeping are practiced in Arizona, that of the desert beekeeper whose principal source of honey is from the mesquite, catsclaw, guajilla, and annual flowers, and that of the beekeeper who depends on irrigated farm crops for honey plants.

Most of the farming in Arizona is either near Yuma in the southwest part of the state or near Phoenix in the Salt River Valley. The Phoenix area has been described as the largest, most highly intensified, scientific agricultural development in the world. There are several other lesser irrigation projects in other parts of the state. Some beekeepers get honey from both areas, either due to favorable locations or by moving their bees from one location to another.

My apiary is only one-fourth mile from the Mexican border in the southeast corner of the state at an elevation of 4000 feet, in the broad Sulphur

Especially written for Gleanings by Paul J. Nichols

XUM

Springs Valley with distant mountains on every side. It is located in heavy second-growth mesquite with cottonwood trees nearby which furnish abundant pollen in early spring.

Rainfall averages about 12 inches yearly and six inches of that falls in July and August.

Brood Rearing Begins in January

Colonies are checked for queens, stores, brood, and health. Nights are normally cool about 25 to 35°F. Day temperatures are 50 to 70°F. About February 15th each colony is fed a gallon of honey with sulfa as a conditioner and stimulant. The very weak colonies are united with the very strong. Later these can be divided as a swarm-control measure, benefiting both colonies.

March is the most critical month in this locality. Often there is not sufficient spring rain to bring out any wildflowers and unless ample stores have been left on the hives colonies may exhaust their food supplies before the main honey flow from the mesquite.

The mesquite usually blooms in May. It has bloomed as early as April 5th and as late as June 1st. Generally there are 30 to 40 days of almost perfect flying weather during the mesquite flow. Only once in over 45 years is there a record of a complete mesquite failure in this area.

During the first half of the honey flow the mesquite honey is almost water white gradually darkening until near the cessation of the flow it is a rich amber. There is no noticeable difference in weight or flavor between the light and the amber honey.

Daytime temperature may rise to 100°F. or more. Supers are added as needed and they are staggered or set back on the hives for ventilation. Experience has shown that hives set out in full sunlight will produce more honey than those placed in the shade of trees. Shade boards are put on top of the hives during the very hot weather. Hives are faced south or east. A weak colony or division will do better if it is faced toward the two o'clock sun, which allows it to obtain the maximum benefit from the sun's rays.

Mesquite honey granulates rapidly and supers are extracted as soon after they are filled as possible. Colony averages are about 100 pounds but an occasional hive will go as high as 300 pounds. It is possible that these extra large producers may have been accidental two-queen hives during part of the build-up period.

It is best to remove supers and manipulate hives in the early hours of the morning before 10 or 11 o'clock. It seems that the hot sun evaporates the nectar in the flowers in mid-day and bees which are gentle and easily handled in the morning become extremely cross and irritable in the heat of the day.

The last of the mesquite honey is taken off in June and the summer rains usually begin in early July and bring out an abundance of wild flowers. Summer rains and wild flowers are both very erratic and unpredictable and the best time to estimate a honey flow is after it is in the hive. Some years the wild flower honey is of a very fine quality and other years it will be a very poor grade.

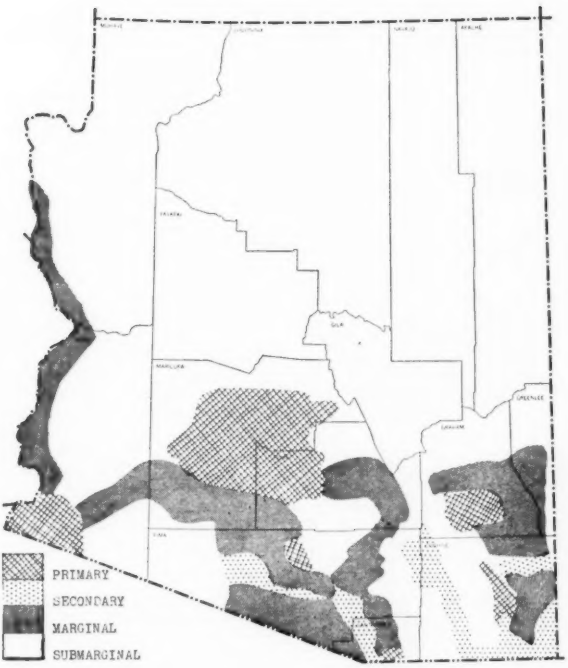
Infrequently some good crops of extra fine honey are obtained from guajilla which grows as a small shrub around here. The moisture requirements of this plant are such that it cannot be depended on as a regular honey plant. There are a few desert shrubs and plants which yield copious quantities of strong dark honey suitable neither for table use nor baking. Notable among these is the "mescal" or century plant.

In recent years considerable irrigated farming has been developed in this county. Last summer I moved my bees to a cotton and alfalfa farm and got a fine crop of honey, equal to the best mesquite honey.

Swarming is always a problem as the bees should be ready for the honey flow by April 15th but the mesquite might not begin to bloom until May 15th or even later. The best control so far seems to be to keep an open brood nest, young queens in the hives, and a few frames of foundation just outside the brood area or a super of partly drawn combs just over the brood nest.

Wintering is Comparatively Simple

Not less than 50 pounds of good



honey is left on the hives and the entrance is reduced to a small opening. Hive covers are fastened on securely or rocks placed on top of them. I have noticed that a hive with a large flat rock placed on top winters better than one with the top bare. Apparently the rock retains the warmth of the sun several hours after sundown. Even in this dry climate an upper entrance to permit the escape of moisture has proven beneficial. Empty supers are stored out in the open. No wax moth damage is experienced when supers are stored out of doors, but stored indoors would be ruined in a few weeks.

During winter and early spring supers and hives are repaired and painted and combs are sorted. I try to eliminate all black brood and extracting combs. I believe that disease lurks in old combs and systematically renewing combs every few years not only produces a better grade of honey but can also be used as a swarm and disease prevention measure. The first step in producing the best grade of honey is selecting good clean, light-colored combs for the bees to store it in.

Selling is almost entirely on a "home" basis, the honey being packed in one, two, three, and five pound containers. I have never produced all the honey I could have sold.

Amber honey outsells white honey about four to one in this part of the country. There is also a good demand for comb honey and each year I try to get a few supers of it. I sell it as cut-comb honey. I have found that it is well worth the time and effort to wire the frames that comb honey is produced in. There will be no crooked combs or fallen foundation and it can be stored and handled better. The wires are easily removed by heating them with two lead wires from an automobile battery and pulling them out with a small pair of pliers.

I have a number of customers who want honey for health reasons. I never inquire as to the nature of their ailment. I just assure them that whatever it is, Honey is good for it.

XUM

Observations on Sugar Concentrations of Cranberry Nectar

by F. R. SHAW, W. M. SHAW, & JOHN WEIDHAAS, Amherst, Mass.

FOR SOME TIME we have been interested in the determination of the sugar concentration of the nectar of honey plants of New England. For several years, we have wanted to make some observations on the sugar concentration of cranberry nectar. This year, as a result of a grant-in-aid*, such observations were made.

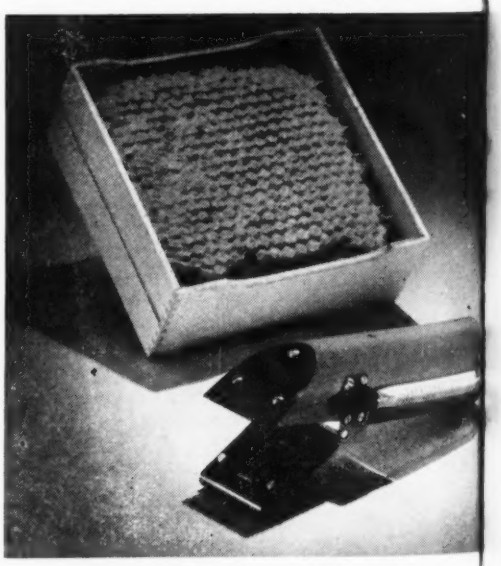
Our interest in this was due to several reasons. Some have stated that honeybees do not work cranberries as readily as they do other plants in bloom at the same time. The speculation had been made that the sugar concentration of the nectar was low. It had also been noted that honeybees working cranberry blossoms do not spend much time at each blossom. Reasons offered to explain such behavior have been suggested. These include small amounts of nectar and pollen or competition between pollinating insects.

All of our observations were made at the State Cranberry Bog in East Wareham. We are indebted to W. E. Tomlinson for his cooperation in this work. Since the State Bog included the varieties Howes, Early Black, and MacFarlin, we were able to make observations on the varieties commonly grown in the northeast.

All three varieties were in bloom. However, there were fewer blossoms in the Howes plantings than there were in either the Early Black or MacFarlin blocks. Bees were less abundant in the Howes and this was particularly true in the afternoon. To secure sufficient bees for our nectar samples, we had to collect about three times as many bees and to spend much more time collecting in the afternoon than we did in the morning. The bees themselves appeared to be more easily disturbed in the afternoon than they were in the morning.

In making the nectar collections we followed the same procedure we have used in the past. The bees are captured in a cyanide bottle and killed. We then clip off the head and squeeze the nectar from the nectar sac. We use only the bees which have large drops of nectar since earlier investigations indicated much variation in the sugar concentration of small drops. The nectar is placed on the prism of a B & L hand refractometer and the percentage of sugar recorded.

Temperature and relative humidity were determined at approximately one-half hour intervals. The temperature



A B & L hand refractometer used to determine the sugar concentration of nectar.

* Teachers' Research—University of Mass.

range was 77-81°F., the relative humidity varied from 64-70 per cent. In general there was an increase in the sugar concentration of the nectar as the temperature rose.

Our data are summarized in the accompanying table:

Variety	Sugar Concentration in %		
	Min.	Max.	Mean.
Howes	46.5	58	50.2
Early Black	40	62	54.7
MacFarlin	38	53	45.7

From these data it is evident that there was a considerable difference in the sugar concentration of the nectar. MacFarlin consistently was lower. There were more bees on both MacFarlin and Early Black than there were on Howes. This is probably associated with the fact that there were many more blossoms on the plots of MacFarlin and Early Black than there were on Howes.

Another interesting observation was made relative to the pollen collecting activities of the bees during the period of observation (roughly 10 A.M. - 2 P.M.). Only two and one-half per cent of all of the bees collected showed any signs of pollen in their pollen baskets. Of course, it is quite possible that observations early in the day would have indicated a higher percentage of pollen gatherers.

Conclusions

From our data it is evident that the sugar concentration of the three varieties of cranberries, Howes, Early Black, and MacFarlin are relatively high. There were obvious differences in the sugar concentration of the different varieties with MacFarlin being consistently lowest. Fewer bees were observed on the Howes, and this is probably correlated with the presence of fewer blossoms on this variety at the time of observations. Relatively few of the bees collected had any traces of pollen in their pollen baskets.

Bee Lore

Illustrated by V. R. Stephen

CHRISTIAN CHURCHES burn beeswax candles because the beeswax in the candles is symbolic of the virgin birth of Christ. This wax is produced by virgin bees, namely the undeveloped female workers.

The drawing shows the Virgin and angel from "The Annunciation" by the Italian master Fra Angelico. This famous fresco is one of a series the artist did in the church of San Marco in Florence, Italy, during the late 1430's.

The Start of Beekeeping Extension Work

As told by
GEORGE REA, Reynoldsville, Pa.

Part III

AS WE WENDED our way over the several miles of dirt road from Marshall to Mars Hill, Mr. Sam's not-too-youthful white horse trudged steadily along with the buggy in which we rode, while he talked with almost youthful enthusiasm about the possibilities of greatly improving agriculture and beekeeping and about the girls' school that was so near to his heart. He was the true pioneer extension worker imbued with the basic idea of our government: A people of Christian integrity, high standards of living and free to develop competitive business without too much government help, and to encourage to the limit basic research and the improvement of our school systems.

He talked freely about these things and, incidentally, told me frankly that he was much in favor of the then almost new agricultural extension program in that area as it was being carried on, and that he was glad to have me there to help with the bees; but he hoped that even the free and helpful extension program would never be dominated by politics.

I am telling this to illustrate the type of men many of the early extension workers were, and we still have such men in most of these positions. They give long, hard hours of faithful service while they sacrifice the comforts of home; and they and their wives and children alike miss many days of happiness together, so that they might help to keep this country the most advanced and well-fed country on earth. In almost all cases this is done on salaries far below the earnings of millions of Americans who act like they have a mortgage on big pay, short hours, pay for hours that they are idle, and have many hours to spend with their families and for pleasures and games.

It is good that the working man is having a break but it is also a good idea to keep in mind what can happen in this country if our food supply fails to meet the needs of the people. Not only are extension teachers needed in the field, but right now our ever-increasing population is a challenge to our ability to increase per acre production of field crops to meet the increasing demand.

Some experts predict that by 1960 the population of the United States will reach 178,000,000 people, or 27,000,000 more than in 1950. At the same time our agricultural publications tell us that basic research in producing more per acre of ground has reached at least a near ceiling in several of the most important food crops. The obvious answer to this problem is greater emphasis on research in the agricultural colleges and experiment stations and by the United States Department of Agriculture. Every man, woman, and child in America has a vital interest in the research program and should see to it that funds are provided to

keep it in front where it belongs. In most of our colleges of agriculture research is suffering along in the background with inadequate funds and deplorably under-manned and under-equipped laboratories.

After escorting me through the school at Mars Hill, Mr. Sams showed me his several colonies of well-kept bees from which he harvested crops of white honey from sourwood and black locust. He then introduced me to his son, Charles L. Sams, with his wife and two little girls. I was cordially invited to stay overnight in their home and enjoyed a pleasant visit with them that evening. Charlie, as he was affectionately called by those who knew him best, had several colonies of bees and, like his father, kept them in modern hives and under skilled management.

The next several days of riding over mountain ridges and down scenic valleys with J. R. Sams in the crisp sunny air of late fall was a treat never to be forgotten. His philosophy of life and his devotion to the cause of better living for all dominated our conversation and yet always keeping in mind the practical job on hand. We must have traveled at least 15 or 20 miles and visited three or four beekeepers each day. It was a tough assignment for the horse, but he was used to pulling the light vehicle over rough steep roads and his long legs never hurried but kept moving easily practically all of the time.

Our visits were mostly brief, just long enough to ask the welfare of the family, to explain the purpose of the visit, and to encourage the beekeeper to adopt improved methods. Demonstration meetings were to be arranged for later dates. A notable asset to the wild beauty of the landscape were the beds and borders of fall varieties of flowers that graced many of the front yards. Petunia, cockscomb, zinnia, larkspur, marigold, and other old-fashioned flowers were plentiful and beautiful. Sams philosophized that anyone who loves flowers just can't be bad inside. Undoubtedly he was right, because to compliment the folks about their nice flowers always brought a smile and relaxation from the tension caused by the sudden arrival of strangers.

Making Moonshine

After several such trips Mr. Sams confided in me his opinion about the most delicate subject in the mountain country, that of moonshine making. In rather picturesque language he summed it up this way: This is a good place to grow corn and it is the chief staple crop; but the market for it is very limited beyond family needs and for the few low-grade animals on these small mountain farms. Corn is bulky and heavy and hard to "tote" to market over these mountains. What then is more logical or economical than to convert a large amount of corn into a much smaller amount of liquid in great demand at high prices that can be "toted" down the mountain in jugs? These are good folks down inside and are doing the best they know how. When they find out how to grow more and better crops and are helped to find a market, the moonshine business will stop of itself and without the interference of government "revenooers." He showed me what he meant one day when we drove over into the valley near Marshall where Sams had helped a farmer named Travis to grow as fine Hereford cattle as I have ever seen. He also had fields of lush pasture for his animals, of mixed lespedeza and orchard grass. Both the Herefords and the improved pasture fields might have been the first in Madison County, North Carolina.

But J. R. Sams had another important project dear to his heart and good for his people. It was better schools, improved schoolhouses with greater facilities. On a trip to White Rock he showed me the first one of the new school buildings under construction and in contrast to the old log building that it was to replace. Pictures were taken of Sams and some of the workmen.

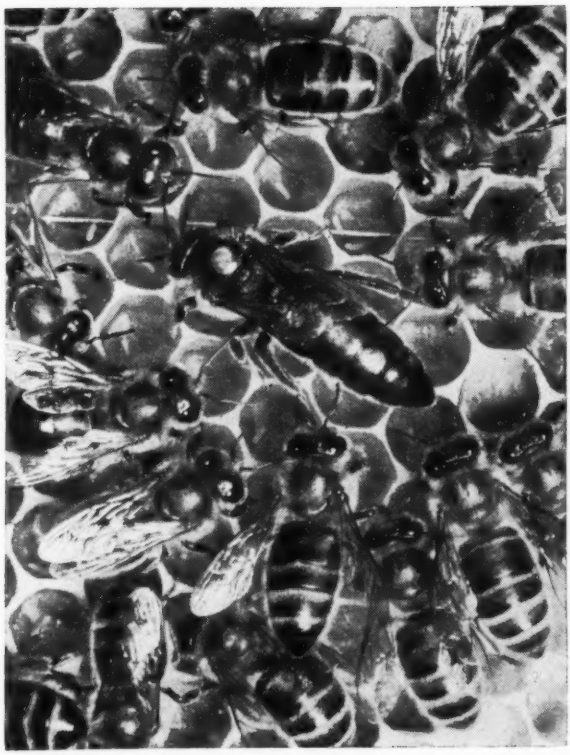
Cover Picture

A package of bees is being added to a weak colony. March is the best time to order packages for delivery in northern fruit bloom areas. — A Pennsylvania State University Agricultural Extension Service photo.

XUM

Introducing

QUEENS EASILY



Ideas by ROGER HOOPINGARNER

Photo by H. DOERING

WHEN A BEEKEEPER desires to introduce a new queen to a colony, his aim should be to put the new queen into the colony as easily and quickly as possible. He should try to do this without upsetting the normal routine of the colony. To accomplish this the beekeeper must remember a few general principles: First, the queen is the most important individual in the colony, because it can not survive without her. Secondly, a laying queen may be laying 1500 to 2000 eggs a day. Therefore, when a beekeeper tries to replace her with a young, newly-mated queen that is nervous and shrunken because of mailing, he then begins to have trouble. With these facts in mind we can then begin to discuss queen introduction.

If the colonies' normal routine is not to be interrupted, then the replacing of the queen with another laying queen is the most desirable method of introduction. Laying queens may be produced by the beekeeper and maintained in nuclei for use when needed. Many beekeepers follow the practice of setting out such nuclei in each outyard. A queen can be introduced to these small nuclei very easily for they do not have the large number of bees that a normal colony has. This method of nuclei-laying queen introduction has its best use during the summer honey flow. Then all that is necessary is to

remove the old queen from the colony and immediately put the new queen into the colony on two frames taken from the nucleus. There are other beekeepers who prefer to put a division screen over a colony and establish a nucleus above the lower colony. This method of upper colony or nucleus lends itself to a modified two-queen colony in the spring and can be used to requeen the lower colony when they are united.

The push-in cage provides the best method of introducing the queen to the nucleus, or to any colony, other than direct introduction of a laying queen. This method is the best all-purpose method and can be used almost any time with excellent results. The push-in cage may be easily made by forming a screen wire box that provides a screened-off portion on the comb for the queen to be confined. This method gives the queen protection until she has enlarged her ovaries and begins laying eggs in the cells of the screened-off area. After three or four days when the queen is released the beekeeper removes the cage and the queen begins to lay.

Although beekeepers commonly use the Benton three-hole mailing cage for queen introduction, tests and experience have shown that it is best to take the time to make and use the push-in cage. The mailing cages do not allow the queen to mingle with bees in the colony before she is released. If the mailing cage is used it will be a little more successful if the attendant bees are removed so that the queen will be fed by the workers of the colony.

When package bees are installed by the direct release method the queen may also be released directly with the bees with good success. At the time the package bees are shaken into the hive the queen is sprayed with a little sugar syrup and then put into the hive with the bees. With the sugar syrup on the queen she can not fly or move very fast, and by the time the bees have cleaned her off the colony is quiet and she will not be killed.

These are not the only methods of queen introduction, but they show the most common methods. With these explanations of the methods and general principles the beekeeper can begin to realize the problems and learn to effect successful queen introduction adapted to his own particular needs.

Ohio Beekeepers

Visiting with Floyd Henderson of Caldwell, Ohio is Charles A. Reese, extension beekeeping specialist for Ohio. We recommend the fine article on package bees by Mr. Reese that appears on pages 139 to 143. — Picture taken by Jack Deyell.

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European Foulbrood Distribution in Minnesota*

Reported by
T. A. GOCHNAUER
and
C. D. FLOYD

EUROPEAN FOULBROOD outbreaks have seemed to be restricted in some areas to certain localities. Eckert (personal communication) stated that it could be found only in certain local areas in California, a fact he attributed to floral source or other differences in food factors. European foulbrood is not found, or not serious if found, in many states in the United States. This fact may lead to difficulties if infected bees are moved from an EFB-unfavorable location to an EFB-favorable location.

The nature of the differences in severity of attacks between certain areas is not understood. It is to be noted, however, that the areas in which EFB is found in Minnesota appear to be on the increase. One factor that hampers our attempts to measure the increase or decrease of the disease is inadequate reporting of it. This inadequacy seems to stem from the old feeling that EFB is a more or less benign disease, an attitude still maintained in many parts of the nation.

A complete history of the recent spread of the disease in Minnesota is not available. It may have been brought into the state from southern areas, and one of the first really severe outbreaks encountered was said to be the result of such an importation. The bees were said to have had an outbreak of disease very early in the year in the southern wintering grounds, recovered from the attack, and then were brought north in nuclei. After establishment of the colonies in the north, the disease reappeared.

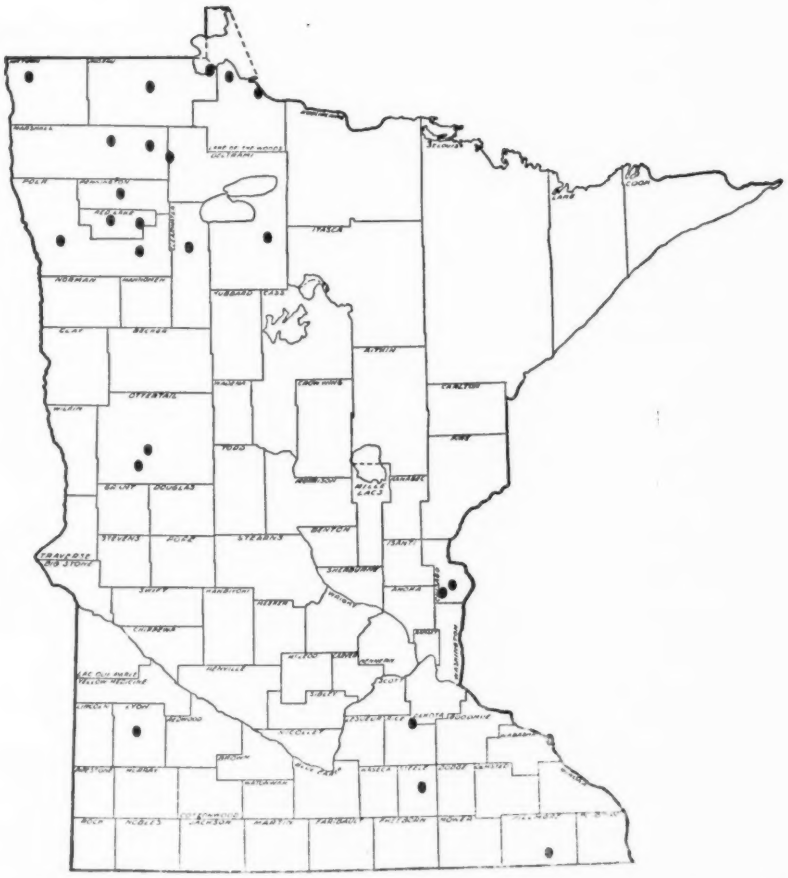
Another outbreak still causing concern supposedly stemmed from the purchase of equipment from a unit that practiced migration to wintering grounds in southern states. Other outbreaks have been traced to rental or purchase of equipment from operations known to the authors to have suffered previously from EFB attacks. One additional occurrence of disease was found in an apiary in which the equipment was stated to be in the owner's possession for several years with no sign of disease; the first outbreak occurred with the importation of package colonies. However, the outbreak was confined to one or two yards, while the packages were hived in many more.

The incidence of EFB seems confined, in Minnesota, largely to the sweet clover and alsike regions of the north and west counties and to the white dutch, basswood, and some sweet clover areas of the southeast and south counties. These are some of the best honey-producing regions of the state. Recently, outbreaks have occurred in Rice and Chisago Counties, quite close to the Minneapolis-St. Paul metropolitan area. Last year an apiary in Lyon County was affected.

Most of the EFB found has contained the familiar microscopic forms of **Bacillus alvei** and the bacteria-like bodies that White called "Bacillus pluton". One outbreak in Clearwater County contained the first reported occurrence in Minnesota of **Bacillus laterosporous** associated with the disease; another, from an unreported source, contained yeasts and streptococci.

Circumstantial evidence would indicate the disease to be spread by drifting, by mingling of supers and brood

* Paper No. 906, Miscellaneous Journal Series, Minnesota Agricultural Experiment Station, St. Paul 1, Minnesota.



The geographic distribution of EFB in Minnesota. Note the heavy concentration in the northwest counties. Each oval mark represents the home yard of apiaries having infection at some time in the past five years. Outyards are not marked on this map. Data were gathered by inspectors' reports and personal contact with beekeepers. Quite probably not all infected apiaries are included.

nests, and the use of contaminated equipment. The latter is sometimes difficult to avoid, since a colony of bees may well recover following a severe attack, and remove the scale which is only loosely applied to the cell wall; yet such apparently cleaned equipment may still be the source of infection the following year.

Many methods of treatment have been used over the years, and in the alpine regions of Switzerland, where the disease is more prevalent in some areas than is AFB, beekeepers are advised to feed warm syrup and contract the brood nests to avoid the effects of the disease. Similarly, older methods of beekeeping in the United States have maintained the best cure for EFB to be a good honey flow, or the use of stimulative feeding in its absence.

Burke (1) has recently reported on the use of Terramycin to control the disease in western Ontario, in an area which adjoins the EFB belt in northern Minnesota. Apparently, feedings of sugar syrup alone did not have any curative effects on the colonies. EFB has been observed to break out in Minnesota at the period of the honey flow itself.

Perhaps the idea of feeding an EFB infected colony is derived from the fact that such colonies frequently border on starvation; the field force is diminishing to such an extent that colonies

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are apt to be found very low on stores.

The relation of temperature to the outbreak of obvious EFB symptoms is an interesting one. EFB is frequently found severe in mountainous areas or northern areas which have cold springs. In Minnesota, the first symptoms of an outbreak in previously infected areas are found to occur shortly after the establishment of warm weather. When an early spring occurs, the EFB outbreaks occur at an earlier time. They occur in Minnesota beginning normally in mid-May in the southern half, and in late May to June in the northern half. Some outbreaks are found as late as early July. Perhaps the method of rearing honeybee brood developed by Michael (2) can be adapted to a study of this problem. Such larvae can be readily infected with EFB. Studies on the effect of the temperature of rearing on the course of the disease in such larvae may help develop an understanding of this phenomenon.

To this date, we have been unable to establish experimental EFB infections for any length of time in the Minneapolis-St. Paul area. Colonies have been inoculated with full frames of diseased brood taken from northwest and southeast Minnesota, and from Madison, Wisconsin. Some spread of infection to adjacent combs was noted in hives containing the Minnesota combs, but this spread was temporary, and the colonies recovered completely. No disease appeared in the apiary the following year. It will be interesting to see whether the infections reported in Rice and Chisago Counties will be the closest approach to this area made by the disease, or whether further spread may occur in the years to come.

REFERENCES

1. **Burke, P. W.** 1955. Control of European foulbrood with Terramycin. Canadian Bee Journal for April, 1955.
2. **Michael, A. S. and Abramovitz, M.,** 1955. A method of rearing honeybee larvae in vitro. Jour. Econ. Entomol., 48 (1): 43-44.

Horehound in Oklahoma

FRANK WELLS, Ripley, Oklahoma

A FEW YEARS ago horehound (**marrubium vulgare**) was brought to my attention as a honey plant by a small patch close to one of my brother's apiaries.

My brother said it was horehound. Others said it was catnip. Through Mr. Mitchel, agriculture instructor and the Oklahoma A and M college, it was identified as horehound, a semi-harmful weed growing wild in Oklahoma.

I found there was none growing in the vicinity of my home apiary, so the last part of May I transplanted six small plants in the hope of propagating it there. Five of the six plants survived with some late bloom until frost.

By the next spring the plants had grown to a bushy plant more than a foot high. By the 5th of May the bees were working the many small blooms and continued to work them until the drouth kept them from blooming. They even worked these plants when the temperature was too low for the vetch to secrete nectar.

The severe drouth that year killed the five plants but not until they had produced a good crop of seed.

The next spring I had a nice lot of plants that were raised from seed in an open bed. I transplanted about 100 early in wild surroundings without cultivation. Animals ate them, even dug up the roots. A later transplanting was destroyed by the grasshopper plague and severe drouthy conditions. Still a later transplanting (last of May) has survived, had some bloom, and is looking well at this time (December).

I believe horehound would be a good honey plant for waste lands. It appears to be drouth resistant and winter hardy, and would be easy to propagate during normal climatic conditions. It grows in wilderness and would perpetuate itself even in severe drouth. One of its traits, the ability to produce nectar at a low temperature may be a benefit in some localities.

The Search for Perfect Combs

by

MILTON STRICKER

Photo by W. A. Stephen

OCCASIONALLY as I inspect colonies, I come across one of 25 frames I made up more than ten years ago. There are only a few left, just enough to remind me of the research I made and the thoughts I had in trying to "lick" a problem that used to worry me so much.

These frames are standard Hoffman size with two bottom bars. The comb comes down to the first bottom bar. Three-eighths of an inch below there is the frame's original bottom bar. There was one hole in the bottom edge of the comb, but when this frame was new, there were no holes at all. I thought I had found the answer to the problem of those troublesome holes that bees are always gnawing in the lower edge of brood combs that are used in the bottom stories of strong colonies.

These holes used to annoy my youth and I spent a lot of time trying to alleviate this situation. At first, I noticed that the holes are largest and most abundant toward the entrance, so I proceeded to place a three-inch strip of tin upon the lower edge of the brood chamber. This I felt diffused the light and caused less chewing. I was wrong. It did nothing. It proved only that I was on the wrong track. However, the tin was a blessing when some colonies were inclined to propolize the front of the bottom bars to the bottom board. As soon as this feature was bred out of my bees, the tins were useless.

I then tried air circulation. In warm weather, I allowed every colony to have a means of upper ventilation. It accomplished nothing except I found what I hadn't known up to that time that if guard bees are sent upstairs to guard a top entrance, supers will be occupied sooner and possibly capped a little sooner.

I then tried bottom boards of several depths, ⅜, ½, ⅝, ¾, 1 inch and a few 2 inches deep. It proved nothing except in the small depths, colonies spent more time ventilating and clustering on the outside of the colony instead of tending to their duties inside during the honey flow. And the extremely deep bottom board—my how bees can build burr comb!

"Warm Way" Bottom Board

I then went over to the "warm way" bottom board. I forget who first advocated ths type of bottom board that is still found occasionally in use in this State.

In this, the frames hang parallel to the entrance instead of perpendicular as in the conventional type of bottom. The first written account I ever saw of this bottom advocated placing one frame of mostly drone brood with a top bar painted for easy identification closest to the entrance, thus allowing a frame for the raising of drones and inhibiting the construction of drone comb in other parts of the hive.

After putting some of these bottom boards into use during one season, I was pleased with the results because I

(Continued on page 191)

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Editorials

Honey and Beeswax Production Increases in 1955

ACCORDING to the U. S. Department of Agriculture Marketing Service, as of January 26, 1956, honey production in the U. S. totaled 253 million pounds, 17 percent more than the 1954 crop. The per-colony average in 1955 was 47.7 pounds compared with 39.8 pounds in 1954 and the 1949-1953 average of 43.7 pounds. The 1955 crop was produced by 5,309,000 colonies of bees, three per cent less than in 1954. Beeswax production was 4,584,000 pounds as compared with 4,025,000 pounds in 1954.

Keep Bees from High Waters

IT WOULD BE interesting to know how many hives of bees have been carried away and destroyed by floods during the past few decades. In some instances losses have seemed unavoidable because waters have risen to unprecedented levels.

During the Lorain, Ohio, tornado in 1928 one of the Root Company apiaries located too close to a stream, was carried away and we never saw the hives again. Some one reported later having seen hives floating down a swollen river near Lake Erie. This taught us a lesson about the importance of selecting apiary sites or locations that are not likely to be affected by high waters.

The recent California floods carried away many hives. Many bees were lost in the recent eastern floods and hurricanes.

The moral seems to be: Don't locate an apiary in a low spot too near a river or stream. When seeking a location for an out-apiary make reasonably sure that the apiary site is safe from high waters. Obtain information from a reliable source, such as a level-headed farmer who has resided in that area for years, or from a county commissioner.

More Legume Production Should Mean More Honey

IN 1955 an estimated total of 528,706,000 pounds of alfalfa, red clover, alsike clover, sweet clover, white clover, Ladino clover, and lespedeza seed were produced. This is almost half again as large as the 1954 crop and is 22 percent above the 10 year average, according to the U. S. Dept. of Agriculture. With the carryover of these seeds, the current supply is 28 per cent above last year and 24 per cent above average.

The program of planting more legumes as advocated by U. S. Secretary of Agriculture Benson, plus the abundance of legume seed on hand, are good omens for apiculture. Here are the first concrete signs of a revival for beekeeping.

Better honey prices are here, thanks to the combined efforts of the American Honey Institute and the American Beekeeping Federation. Stick with beekeeping now and you may soon be rewarded with one of the most lucrative ventures in agriculture.

Secretary Benson Recognizes Importance of Beekeeping

IT IS a satisfaction to beekeepers to know that our Secretary of Agriculture realizes the importance of beekeeping as an essential branch of Agriculture. The following message came from Secretary of Agriculture Benson recently:

"Everybody knows the honeybee is the only source of our annual crop of more than 250 million pounds of honey and four million pounds of beeswax. But too few people realize that the principal role of the honeybee is to pollinate some 50 important agricultural crops so that they will flower and produce seed."

"In the past this essential job was performed primarily by wild insects but under modern farming methods this is no longer possible. We now depend almost

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entirely on the Beekeeping Industry to supply honeybees which can be grown in captivity, moved from farm to farm and protected from insecticides and the farmer's plow."

"The Beekeeping Industry therefore has a basic function of providing one of our most important agricultural tools. It must have our full encouragement including adequate research if it is to carry out this function effectively." — The Honorable Ezra Taft Benson, Secretary of Agriculture, United States of America.

The American Beekeeping Federation

REVIEWING BRIEFLY the activities of our National Beekeepers' Organizations during the years, we find that a North American Beekeepers' Society was formed in Cleveland in 1871 with Moses Quinby as president. In 1885, the National Beekeepers' Union was organized, its purpose being to settle disputes and to defend the legal rights of beekeepers in court. This organization later merged with the North American Beekeepers' Society. In 1889, a National Beekeepers' Association was founded in Philadelphia and the old National Beekeepers' Union was dissolved. This National Association had its ups and downs during the years.

The American Honey Producers' League was formed in 1920. At a national meeting of the League held in Chicago during January, 1943, Mr. James Guin, President, with a committee, formed the framework of an organization to be known as the National Federation of State Beekeepers' Association. The name was eventually changed to The American Beekeeping Federation as it is today.

The Federation prior to 1953 served a purpose, but did not enjoy smooth sailing due to factions within the industry and lack of financial support. Early in 1953 at the San Jose National meeting, amendments were made to the constitution which resulted in a better functioning organization. At the same meeting Henry Schaefer was elected president. Due to the perseverance, hard work, and ability of Mr. Schaefer and his committees, better feeling and greater cooperation began to emerge.

The Federation was formed to promote the general welfare of the industry. The activities are many and varied, as for example, representing the industry in Washington, sending witnesses and delegates to all hearings regarding the industry, and requesting programs from the Department of Agriculture beneficial to the industry.

During 1955, the Federation requested a loan and purchase agreement program for honey at the same price level in cents per pound as prevailed the previous year. It requested a reinstatement of export subsidy program if and when a surplus of honey is apparent, and a loan and purchase agreement program for chunk honey. The Federation through its research committee headed by Clarence Benson requested $200,000 in additional funds for research for our industry, and $100,000 was allotted. Working through the Honey Council of America the Federation assisted the National Honey Packers and Dealers Associations in getting a check-off plan in operation. The latter plan is to provide funds for private research on honey and honey promotion by the Federation and American Honey Institute.

The ultimate goal of the Federation is to improve conditions in the industry to the point where income from beekeeping will be on an equitable level with other agricultural activities and to the point where the beekeepers' sons and other young people will be interested in continuing the industry instead of seeking employment in other higher paid occupations. For further information on what the Federation has done and is doing, write the Secretary-Treasurer, Mr. Robert Banker, Cannon Falls, Minnesota. Mr. Banker has done splendid work.

Our congratulations to Henry Schaefer and members of his committees for what has been accomplished thus far. Our best wishes to the new officers and president Joaquin Watkins who, by the way, rendered invaluable service to the industry as Vice President during the past year, and to Ray Reed, the new Vice President.

Our industry needs The American Beekeeping Federation. Let's continue our moral and financial support.

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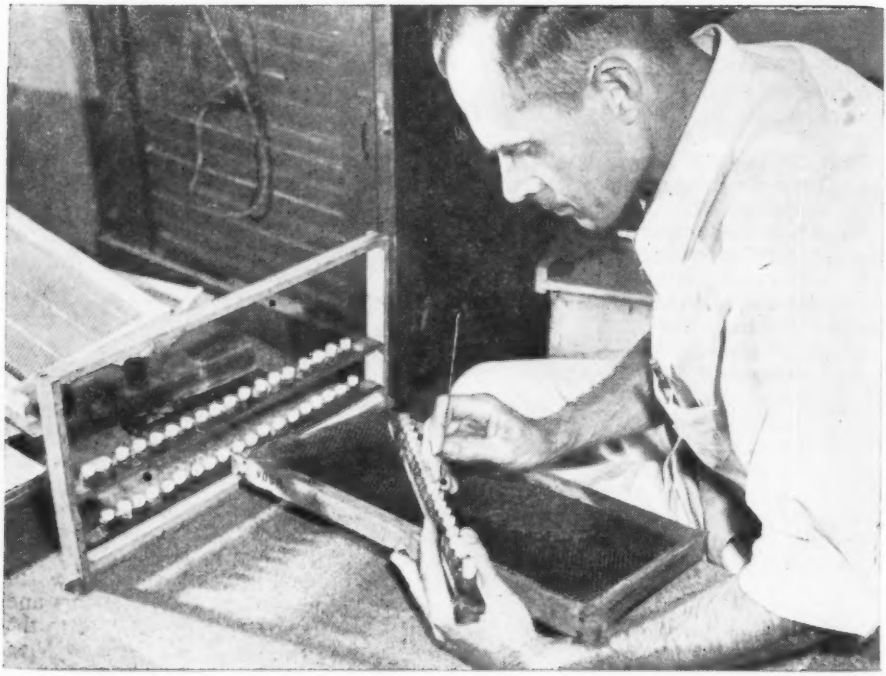
News

Trophies—Winning trophies at the American National Honey Show.



Dr. Otto Mackensen, apiculturist at the U.S.D.A. Southern States Bee Culture Station, Baton Rouge, La., is shown placing day-old worker larvae in the bottom of queen cell cups.—USDA photo by Forsythe.

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Stingless Bees. A hive of stingless bees from Brazil belonging to the genus Trigona opened to show the construction of the nest, the box-like hive, and its size. The bees fly in and out of the nest by means of a small hole on the lower side. In opening such a hive it is necessary to do some damage to the nest as can be seen in the photograph. The white portion on the left on both the lid and the box is part of the brood compartment. The right side of the nest is used for the storage of honey and pollen. The nest is covered by thin sheets or flakes of beeswax.—USDA photo by Forsythe.

John Lis, Illinois beekeeper, gives samples of honey to children visiting his honey house.—Photo by Joseph Sedlak.

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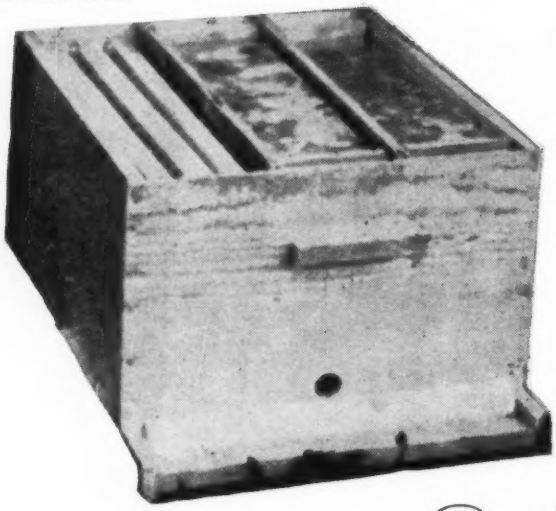
Three nucs in a Standard hive.



by R. L. PARKER
Kansas State College

Photo by W. Le MAISTRE

Colony Increase

Early Spring Division

KANSAS BEEKEEPERS, as a general rule do not use package bees and queens to increase their apiaries, since the cost is much more than buying untested queens to divide a certain number of their strongest colonies. This division time is the same as that for establishing package bee colonies, i.e., April 1 to 15 in the southern part of the state, and April 15 to 30 in the northern or western parts.

The old queen of the colony and half of the sealed and unsealed brood and bees are placed in a brood chamber on a bottom board on a new stand within the apiary. Sufficient room and honey are given to this nucleus to provide for the spring needs until the first major nectar flow. The other half of the colony is given the new queen recently received from the South. This nucleus on the old stand is provisioned in a similar manner; cover both colonies. Such divisions will be ready to participate in the first major nectar flow if given proper amounts of food and spring protection. Spring division of colonies to some extent, prevents swarming later by the colonies so treated.

As a Swarm Preventive

About two or three weeks before swarming time or when two-story hives need additional comb space, insert a queen excluder between the brood chambers and another above, then add a super of combs on top. Destroy all queen cells present. Examine the colony eight or ten days later and find the queen in one of the brood chambers. The hive body containing the queen is placed on a bottom board. Set the hive on a new adjacent stand, then cover. On the old stand adjust combs so that the sealed brood with adhering bees is in the colony and, if necessary, exchange empty combs for those containing sealed brood. Introduce a young laying queen to this colony.

This procedure generally solves the swarming situation for the season. There is now an increase of one colony for each of the colonies so treated. The one-story colony with old queen may be requeened, or later the two colonies can be united and the old queen de-

stroyed. Young laying queens, ready for use, can be maintained in queen reservoirs (three to five comb nuclei).

During a Nectar Flow

Later in the season increase is best made by a three to five comb division, similar to that of early spring division. Queens could be raised earlier from colonies producing supersedure cells, to be ready August 15 and maintained in queen reservoirs.

During early major nectar flows, at the beginning of the decline of incoming nectar, two combs of sealed brood with bees and one or two combs of honey and pollen are placed in a hive. Fill with six empty brood combs. Move to a new stand, preferably away from strong colonies. A young laying queen is introduced. Contract the entrance to protect from robber bees if the nectar flow should cease. Such nuclei, if established during the white clover or yellow sweet clover nectar flow, should increase in strength during the season and store enough honey (one full-depth super) for wintering.

Swarm vs. a Honey Crop

Swarming is the natural division of a colony. Part of the colony leaves to establish a new home, leaving behind the means of continuing the colony. It is good beekeeping practice to prevent swarming if a person is seeking a crop of honey, since a division of the working force prevents the possibility of obtaining a crop of honey. Again, it is much easier to divide a colony and handle it in beekeeping equipment. Many times, division or increase of colonies is made in Kansas during April. If divisions are made properly in the spring, the beekeeper has the possibility of producing a crop of honey from the two parts of one colony so divided without having difficulty with swarming.

Capture and Hiving

After a swarm issues from a hive it may settle on a near-by tree, a fence post, or possibly a fire hydrant. If clustering takes place within two or three feet of the ground, as on a fence post or the trunk of a small tree, it is comparatively easy to capture the swarm. A hive is placed adjacent to the location of a cluster of bees, preferably facing southward or southeastward. The bottom-board is placed two or three inches from the trunk of the tree or fence post. The inner and outer covers are not placed on the hive until after the bees definitely begin running into the hive.

Aids to Hiving

It is wise to have a smoker in operation, ready for action to drive the bees toward the entrance of the hive. A convenient brush can be made by using a handful of smooth leaf, stiff weeds to dislodge the bees from the clustering spot and knock or push them onto the top bars of the frames in the hive and onto the bottom-board at the entrance. Brushing may have to be done two or more times in order to get the majority of the bees to the entrance and moving inward. After the first one or two brushings, the inner cover and telescoping cover are placed on the hive so that all of the attraction for the bees will be at the entrance. Gentle smoking of the bees at the entrance will cause them to run in more readily. The clustering spot also should be smoked to obscure the odor left by the clustering bees. When the bees begin a definite movement inward ("running"), the swarm can be left to adjust itself to its new quarters.

Removal of Limb Method

When a swarm settles high in a tree, it is more difficult to capture. If the clustering location is near the tip of a limb, the limb may be cut off and carefully lowered to the ground. Before one climbs the tree to capture the swarm, the hive should be arranged on the ground in about the location that the branch will be lowered. The covers should be removed. The bees on the branch when brought to the ground may be given a sharp, quick shake to dislodge them upon the tops of the combs and at the entrance. After the bees begin a steady movement into the hive, the covers may be placed on it.

Prevention of Disease Infection

Swarms from an unknown source should be hived on full sheets of foundation. Such swarms may be carrying American foulbrood infected honey which later would be fed to young larvae and cause a disease condition to arise. If the swarm issues from a colony free from American foulbrood, it can be hived upon combs.

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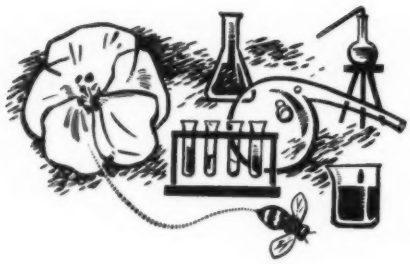


Bee Facts

(A Digest of Scientific Research)

Edited by Walter Barth

Beeswax Helps to Build Autos.

PRODUCTION of cars and trucks calls for many strange ingredients before the "cake" is pulled from the paint-drying ovens. Automotive purchasing agents are paid to worry about the supply of these materials—among which is beeswax. When this material is applied to bolt threads it speeds the tightening of nuts.

Automobile Facts. Sept. 1955. Vol. XIV: 6, Pg. 6.

Collecting Beeswax in Tanganyika.

MOST OF THE year the beekeepers of Tanganyika, Africa, live in tsetse-fly-free settlements cleared of forest, but in July they go out to their camps in the forest where they have their beehives. Some of the camps are as much as 50 miles from the settlements. The camps are sited near permanent waterholes and are usually composed of a number of small huts, one to each beekeeper, arranged in a circle and connected by a stockade providing a central protected compound. In the middle of the compound is a fire where meals are cooked and beeswax prepared. There may be as many as forty of these tiny camps in the forests around the settlement.

Through the months of July and August the beekeepers live in their camps, going out each day to collect the crop from their hives and occasionally going to the settlement to carry in beeswax or honey and to bring back food. As no domestic animals, except the odd scraggy dog, can live in the tsetse-fly-infested forest, all loads have to be carried on the head or on the carrier of a bicycle. In years when there is a big crop the beekeepers clear a road out to their camps so that a lorry can come out and carry in the crop.

The beekeeper usually starts work in the early morning when it is cool. Some climb up the trees with a handful of smoldering twigs and blow the smoke into the hive. Others lower the hive to the ground and place it beside a small fire whose smoke they use to control the bees. Some of the more progressive beekeepers use modern bellows smokers in which they burn dry grass or elephant dung. If the bees are really fierce then the smoke of smoldering puff ball fungus may be used to put the bees to sleep for a short while, otherwise the fierce bees are dealt with at night.

When the bees have been driven to the far end of the hive the beekeeper cuts out the honey comb. The best beekeeper leaves the old dark comb, which has been used for breeding in the hive. This provides some food for the bees to live on until the next flowering season. Some beekeepers take all the combs and then the bees have to migrate leaving the hive empty. However, the beekeepers as a whole are learning to take care of their bees and experience has shown them that a hive that starts the new season with an established colony will produce a bigger crop than one that has been occupied by a new swarm only recently. When the crop has been collected, the hive is closed up and replaced in the tree.

Most of the beekeepers are quite immune to the effects of bee stings but some are now using wire cloth bee veils to protect their heads and others are even using boiler suits and special bee gloves.

Smith, Francis G. Beeswax. Tanganyika Bee Div. Pamphlet 1.

FROM Foreign LANDS

Translated and Edited by Erika Barth

Australian History.

IT SEEMS that the entire beekeeping world is becoming conscious of their local beekeeping history. This is a wonderful trend for many valuable facts tend to become lost and forgotten if they are not recorded.

The latest report concerns Australian beekeeping history, and was prepared by F. L. Morgan. In this paper, the first of a series, it was interesting to note that honeybees (**Apis mellifera** L.), as we know them in America, were never native to Australia. Honeybees had to be imported into that country.
Australian Bee Journal. Oct. 1955.

Honey Helps in Heavy Workouts.

HUNGARIAN distance runners, Laszlo Tabori and Sandor Iharos, include honey in their diet. It is reported to be their favorite energy food. Honey, especially at breakfast and lunch, seems to do them the most good. The Hungarians will engage in a heavy morning workout before an afternoon race. These sportsmen work up to such a training schedule gradually, but in any case, honey is one of the energy foods that gives them a quick recovery from fatigue.
Sports College News (Canada). Dec. 1955.

Is the Air Temperature in the Beeway Constant?

THE AIR temperature in any beeway in a breeding colony is not constant, according to research conducted by Dr. A. Budel of Munich, Germany.

"According to the actual state of the brood, there are brief variations of temperature, especially during tidying up of cells, least of all during the first stages (eggs and youngest larvae). If there are different stages of brood in one comb or in neighboring beeways, temperatures, typical of various stages, overlap. If the beeways next to the brood are not sufficiently stocked with nurse bees, the temperature of the air varies rapidly and does not correspond to particular brood stages."
Zeitschrift fur Bienenforschung. Oct. 1955.

Normal Queens Hatched from Laying Worker Eggs

EGG-LAYING worker bees are recognized by their more developed abdomen and by the respect they receive from their sisters which is equal to that shown true queens. The egg-laying females were marked and placed in nucs for observation. They were observed laying eggs, which were normal, but quite often many eggs were placed in one cell. As soon as the larvae developed, a battle for survival began until only one larva remained.
Spanish Bee Journal "Apicultura" June 1955.

Hive Vandals.

LAST SEPTEMBER two youths set fire to a hive of bees in order to drive out the bees and steal the honey. The vandalism occurred near Huntingdonshire, England. Fortunately the thieves were caught.

The young men were brought to trial and fined. According to their statements, they lit some grass under the hive first but it went out. Then they opened the hive and set fire to a sack, which caused it to catch fire. They attempted to put out the fire but were afraid of the bees that were buzzing about.
British Bee Journal. Dec. 1, 1955.

Not Properly Insulated.

An electrician's little boy was found howling in the garden.

Father: What's the matter, Johnny?
Johnny: I picked up a little bee and one end of it wasn't insulated.

Bee Craft. C. Allan Birch. Feb. 1954.

XUM

Live and Learn

by Propolis Pete

SOME DAY you young fellers out there are going to find that a deep super full of honey is a lot heavier than it is now. If it is really full it can go up to 70 pounds. That's a lot for some of us old geezers to rassle around, especially when they are on a colony four or five high. Last year we were going to see if it would work to make up a hive of three-quarter depth bodies. The idea was to see if the bees liked them well enough to make it worth while to change over from the regular deep bodies.

Since writing about it, I have heard from a number of people who thought of it before I did. They say that it works. Some have tried it in the regular shallow supers, but to my mind these would be a little scant. If your bees are anything like mine, they will build burr comb between the bottoms of the top frames, and on the tops of the bottom frames. Pretty soon this could lead to a situation that would make the hive like an old-fashioned box hive. The 6⅝-inch size seems to be a happy medium. Three of them would approximate a two-story standard hive, with the added advantage of a space for the bees to move sideways during the winter when they are clustered.

The idea last year was to hive the first swarm on three of these bodies, and then add supers as they were needed. The supers could be the regular shallows, or the same size as the brood bodies. The three-quarters bodies would be better in the sense that they would be completely interchangeable. Well, the experiment never came off because the bees wouldn't cooperate by swarming. Towards the close of the honey flow, two of these bodies were put on a strong hive, which drew out the foundation and filled it with honey.

This year we can do it without waiting for a swarm. I have the two bodies all ready, and will install an early package to give them a chance to build up on drawn combs. I don't like to start packages on foundation, but of course there are lots of times when it has to be done. The idea looks even better this year than it did last year, and if it works, it will solve a problem that gets more serious every year. But like most solved problems, it will create a new one. What to do with all the old stuff. I suppose that in the course of a hundred years or so I could sell it as used equipment, but some of it is pretty well shot after the years of abuse that I have been giving it.

Right now there don't seem to be any reason why it won't work as well as the so-called standard equipment. Who fixed that standard anyway? I doubt if the bees were consulted, and it seems to me that I have heard that the dimensions were fixed by some ancient saw mill that made boards of that size. Judging by the cavities that the bees pick for themselves when they use their own judgment, the size and shape don't seem to make much difference.

I have had a fairly big swarm try to take possession of an observation hive that was already occupied. By golly, you couldn't get another bee in that box with a wax press, and there was a big cluster of about three pounds hanging onto the front entrance that tried to but couldn't get in. They re-swarmed about a week later, but that was another story. Maybe the original tenants got disgusted and the surplus went along for the ride.

At the other extreme, I have had a swarm about the size of a bunch of grapes take possession of a pile of empty supers stacked six high. The cork had fallen out of the winter entrance on one of the boxes, and these ambitious beggars claimed title to the whole stack. And many times I have seen bees occupy the wall of a house, drawing their combs in the space between the studs. Since the studding was 2 x 4's the bees made up to 30 itsy-bitsy combs over a section six feet or more long. Another swarm in a chimney must have hired a gang of mountain climbers to go from the top to the bottom and visa versa.

Anyway, if it works as well as expected, I'll tell you about it at the end of the season. You never can tell what unexpected things you will run into with bees, and anybody who will say

(Continued on page 189)

Apples the Honey Way

MRS. BENJ. NIELSEN
Aurora, Nebraska

Honey apple pie.—Photo courtesy of the Kellogg Co.

GRANDMOTHER FIRMLY insisted that "an apple a day keeps the doctor away". True or not, it makes mighty good eating! Baked, boiled, fried, the honey way, of course, each is a taste treat deluxe. Never tried honey baked apples? Do! Wash, core, but do not peel apples of the kind you like to bake. (Ours is the Jonathan!) Then fill cavities with dates, raisins, or pineapple, maybe a few redhot cinnamon candies, then drizzle liberally with honey, dot with butter and sprinkle with cinnamon. We like a bit of pineapple juice as the baking liquid. Um! Um!

Fried apples? Peel and slice apples thinly. Start to cook in a liberal amount of butter, cooking slowly. When almost done, add salt to taste and add honey to the desired sweetness. Reduce heat and simmer slowly, stirring frequently, until apples are golden brown. Serve piping hot. Delicious!

Honey Apple Pie

Five cups thinly sliced apples, 1 9-inch unbaked pie shell, ½ to ⅔ cup honey, 1 teaspoon cinnamon, 2 tablespoons butter, and 4 cups sugar-coated cornflakes.

Arrange apples in pie shell. Combine honey and cinnamon and sprinkle over apples. Dot with butter. Crush sugar-coated cornflakes slightly; sprinkle over pie. Cover. Bake in hot oven, 425 degrees F. about 30 minutes. Uncover; lower heat to moderate, 375 degrees F. and bake about 20 minutes longer.

Honey Apple Crisp

Six to eight apples, peeled and sliced, medium thick, ⅓ cup honey, ½ cup brown sugar, ½ cup butter, ¾ cup flour, sifted before measuring.

Place peeled and sliced apples in greased 2-quart casserole. Drizzle with the honey. Blend together with a fork until crumbly, the butter, sugar, and flour. Pack firmly over the apples. If apples are very dry, 2 tablespoons water may be added. Bake in moderate oven 375 degrees. 45 to 55 minutes. Serve with honey-sweetened whipped cream.

Honey Apple Tapioca

Two and ½ cups thickly sliced tart apples, 3 tablespoons butter, ¼ teaspoon mace or cinnamon, ½ cup quick-cooking tapioca, ½ cup light brown sugar, firmly packed, ⅓ cup honey, 3 cups water, ¾ teaspoon salt and 2 tablespoon lemon juice.

Grease casserole. Place sliced apples in casserole, dot with butter and sprinkle with mace or cinnamon. Combine tapioca, sugar, honey, water, salt, and lemon juice in saucepan. Bring to boiling point over medium heat, stirring as needed. Pour over apples in casserole. Cover. Bake. Serves six.

XUM

A Talk to Beekeepers

M. J. Deyell

You Can't Learn Beekeeping in a Day, or a Year

IN A PREVIOUS talk I may have mentioned receiving a letter from a lady who wished to have us tell her all about beekeeping. She apparently did not understand that in order to learn beekeeping it is necessary to acquire information through reading good beekeeping literature, talking with successful beekeepers, then getting some bees with the idea of combining theory with practice in order to learn the fundamentals of the business.

A few years ago a lady out in the country asked me to look into some hives of bees she had acquired and tell her how to manage them. As she looked over my shoulder as I was examining the combs, she asked me how long it would take to learn beekeeping. She apparently thought it was possible to learn the business in a short time. When I said that it might take years she seemed quite surprised. Of course I explained to her that it was perfectly possible to make a start and learn the business gradually each year, until she could handle the bees properly and secure some surplus honey.

We never learn all there is to know about beekeeping, even though we have been in the business many years. One thing that makes beekeeping so interesting is that there is much to know and we are always learning, that is, if we are open minded.

We Must Have an Objective in Beekeeping

It seems to me the objective should be to secure the maximum crop of honey at the minimum of expense. Apparently some beekeepers do not have an objective. That is the reason they do not make better progress.

A few years ago a tramp came to my back door for a hand-out. We are not supposed to feed tramps in our town, but I did give him a sandwich and as he started off I asked him where he was going. He said he did not know. It was apparent that one reason he was not getting anywhere in life was that he did not have an objective, or any particular place to go.

Keeping Bees by Rote

Some beginner beekeepers seem to think that all there is to beekeeping is performing certain manipulations at certain seasons of the year, for example, cutting out queen cells, putting on supers and removing surplus honey. No two seasons are alike. Nectar and pollen plants come into bloom earlier some seasons than others. We should keep in close touch with the development of honey and pollen plants and have our bees ready to take full advantage of honey flows when they come.

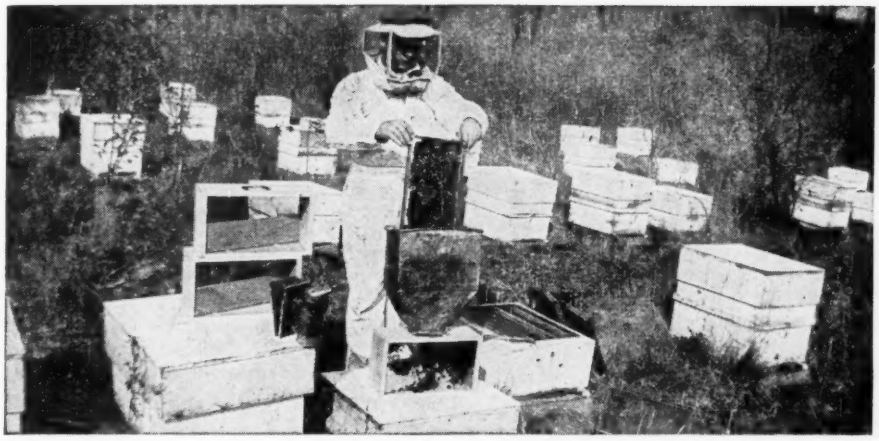
Some beekeepers are just plain lucky in that they happen to do the right thing at the right time and secure some surplus honey. Other beekeepers do the wrong thing at the wrong time and consequently do not get much, if any, surplus. We should learn more about bee behavior then base our manipulations of colonies on this knowledge.

Keeping Ahead of the Bees

In the vicinity of Medina bees are likely to collect the first pollen the last few days in March or the first week in April. This pollen usually comes from pussywillow. As soon as bees begin storing pollen and a little nectar, the queens start laying as prolifically as the weather and conditions within the hive will permit.

Bees in the South, especially the southern tier of the states, are further advanced early in the spring, than they are in the North. This is natural. Some years ago I recall visiting a beekeeper near New Orleans, Louisiana, on January 1st. We went into a couple of colonies and found brood in three combs and a few young emerging bees. I recall going into some of our double-story colonies in western Ohio one winter, on February 14th, and finding brood in three of the center combs, small patches of brood about the size of my hand, with young emerging bees from the center comb. That showed me that the queen had begun laying the latter part of January.

During March beekeepers in some of the southern states secure some surplus honey and it is necessary to give strong colonies supers in advance of the early honey flow.



A common method of shaking bees from combs into a bee shipping cage.

Watch for Dead Colonies

Here in the North, it is a good idea to visit out apiaries on a warm day in March when bees are taking their first good cleansing flight. If any colonies have died during the winter, the entrances to these hives should be closed tightly to keep out robber bees. I have discovered that when bees in an apiary get started to rob early in the spring, they are likely to continue for a time. By this I mean that these robber bees may try to get into other hives that are not quite up to par in strength.

Colonies that have died as a result of starvation will not have any honey in the combs of the hive. However, there may be other colonies that have died as a result of queenlessness and there may be some honey in the combs. One way to utilize such combs is to put a package of bees with a queen into each of these hives in which colonies have died. The dead bees should be cleaned out of the hives and the entrances should be made bee-proof until the packages are ready to be installed.

Watch for Disease in Areas Where American Foulbrood is Prevalent

It is well to examine the combs in which bees have died during the winter to determine whether or not the loss of the bees was due to foulbrood. If you find perforated cells in the combs where the last cycle of brood emerged and the dead larvae are lying lengthwise on the bottoms of the cells and these larvae or dried down scales are difficult to remove from the bottoms of the cells, this is an indication of American foulbrood. The contents of the hive should be burned in a deep pit and the hives scorched out in order to make them safe for future use.

What to Do with Weak Colonies

Even in the best apiaries there are likely to be a few weak or undersized colonies. Some of them may die if they are not strengthened with young bees. The best way to bring such colonies up to normal strength is to give each a two-pound package of queenless bees. To unite the package with the weak colony, simply feed the bees in the weak colony as well as the package of bees, all the sugar syrup, made of equal parts granulated sugar and water, that the bees will take, then dump the package at the entrance of the hive containing the weak colony, if the weather is warm. If the weather is cool, take out two or three frames from the side of the hive containing the weak colony and dump the bees in this space. The two lots of bees will unite quite readily because all of the bees are filled with sugar syrup.

Carrying Bees from One Apiary to Another

I have a few yards of bees out from Medina. In the past I have shaken bees from very strong colonies into shipping cages and have carried them to another yard which had colonies that needed strengthening. This has work-

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ed out quite well. Such bees shaken here in the North are likely to be older than package bees secured from the South and are therefore not so suitable for strengthening weak colonies as are packages from the South.

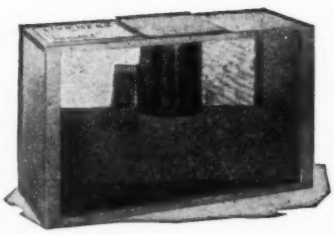
Don't Let Bees Starve

It is safe to say that more bees starve during March, in the North, than during any other month. At this time queens have begun to lay and brood rearing is underway. Large amounts of honey are used for brood rearing. One can usually tell by hefting each hive whether or not it needs food. If the hive feels light, I feed some granulated sugar if the weather is warm enough for the bees to take the sugar. If the colony is very light and needs food badly, I feed sugar syrup. A simple way to feed granulated sugar is to pour it on the inner cover of each hive. When the center block is removed the bees will come up through the small opening and take the sugar. This space on the inner cover will hold about three pounds of granulated sugar. I can recall one spring when the weather was very wet, that I fed 30 hives of bees in less than three quarters of an hour. It was impossible to drive into the yard, so I had to carry in the sugar from the road. I simply put the sugar in a large bucket, then took a five-pound honey pail and dipped enough sugar out of the container to fill the space in each inner cover.

The bees had consumed a considerable amount of stores that spring. The weather was so wet that the bees could not get out to work nectar plants that were available. The sugar I fed saved the bees until they could fly out after nectar when the weather turned warmer.

Keep Entrances Reduced During Cool Spring Weather

I use an entrance reducer in each of my hives during the winter to keep out mice and to prevent cold air from blowing into the hives. I have found that it pays to leave the entrance reducers in until settled warm weather comes. The regular entrance reducer purchased at supply houses has two openings, a small opening of about 1½ inch by $\frac{5}{16}$ inch, and an intermediate entrance of about 4 inches by $\frac{5}{16}$ inch. I use the intermediate entrance.



One type of bee shipping cage with feeder can and queen cage suspended by a wire.

How Colonies Increase in Strength

Early in the spring the queen will form a brood nest in the center combs of the hive, usually below sealed honey. About the middle of March in this latitude it is not uncommon to find brood in four or five combs. The patches of brood in the combs are egg shaped, the sealed brood being in the center and then the unsealed, and at the outer edges of the combs the newly laid eggs. As soon as the queen has completed one cycle of brood, which takes 21 days, young bees begin to emerge from the center of the combs where the first eggs were laid. The queen will then start another cycle of brood in the cells from which young bees have emerged. After the first cycle of brood has emerged, the colony is likely to build up rapidly, provided it has ample honey and pollen.

"Height makes me dizzy....so you go find someone else to mate with."

Let's talk about honey plants

HARVEY B. LOVELL,
University of Louisville

Lowbush gallberry (Ilex glabra)

Gallberry (Ilex glabra), an evergreen shrub, two to six feet tall, is the outstanding honey plant in southern Georgia and adjacent Florida, and very important in the South Atlantic States and most of the Gulf States. It blooms in April and May in most of these areas. It yields large amounts of a yellowish light-amber honey which has an interesting aromatic flavor. Beekeepers in the area soon learn to appreciate the honey and prefer it to all others. It grows chiefly in swampy lands and is particularly abundant in and around Okefenokee Swamp where it is not affected by the weather. Where gallberry is abundant, the late J. J. Wilder reported that it was impossible to overstock a territory with bees.

Highbush gallberry (**Ilex coriacea**), a shrub up to 10 feet tall in much the same localities, yields a very similar honey except that it sugars more rapidly than that from the lowbush species.

Georgia. A. V. Dowling is a leading exponent of chunk honey made from gallberry. When I visited him in August, he kindly showed me many of the honey plants of his area. He explained that southern Georgia is the leading state in the chunk honey business because pure honey from lowbush gallberry does not crystallize. Neither does the honey from tupelo with which it is often mixed. This makes it possible to sell chunk honey throughout the winter, a feat which is not possible with honeys that granulate rapidly.

Florida. From Fort Pierce, Walter Leverette writes me that gallberry blooms from April to June and "produces a honey with a mellow flavor which smells like a spring meadow". His largest surplus is 100 pounds but his average is only 20 pounds per colony. Fire has destroyed most of the shrubs in his section. Mr. Berk at Holly Hill reports that his best season was 11,000 pounds of gallberry honey in five weeks with 80 hives, and one strong hive made 225 pounds. He adds that it yields best in dry weather.

Alabama. O. K. Anderson writes me from Coffee Springs that he averages 50 pounds per colony of gallberry honey. He considers the flavor and quality very high and claims, "People who once taste gallberry honey never want any other kind".

Mississippi. According to W. E. Plant of Hattiesburg, gallberry produces a light-colored honey with a heavy body and an excellent flavor which he describes as tempting. His largest surplus from one hive is 200 pounds with an average of 30 pounds. In his area it fails about half the time. He adds, "Our most valuable source. The honey outsells clover locally. We have kept it two years without granulation". Mr. Merrill of State Line reports that his average is 75 pounds and that he has never seen gallberry

(Continued on page 188)

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Federation's Trek to South Successful

Reports ROGER A. MORSE

1956 American Beekeeping Federation Annual Banquet.

OVER 400 beekeepers, beekeepers' wives, apiary inspectors and researchers attended the 13th annual convention of the American Beekeeping Federation, Inc. and allied industries held in the Buena Vista Hotel in Biloxi, Mississippi, January 23 to 26, 1956. According to secretary Robert Banker, this meeting had the best overall representation of beekeepers ever found at a national meeting in recent years.

The annual banquet was held in the hotel auditorium with Alan I. Root of The A. I. Root Co. of Medina, Ohio as Toastmaster. The banquet was attended by 366 persons, representing 37 states, District of Columbia and Canada. A roll call by states showed that Illinois had the greatest number of persons in attendance with 27 being present. Mr. Root presented Mr. Henry Schaefer, retiring president of the Federation, with a wrist watch given him by the executive committee for his outstanding service during the last three years.

According to secretary Robert Banker of Cannon Falls, Minnesota, membership in the American Beekeepers' Federation has increased from 926 in 1954 to 1186 by December 15, 1955.

Dr. C. A. Jamieson, Dominion Apiarist, Ottawa, Canada, spoke both in the meeting of the Apiary Inspectors of America as well as in the general session on Nosema disease and research on the subject of bee diseases during the past few years. While Nosema remains a serious problem in Dr. Jamieson's estimation, he pointed out that other serious adult bee diseases such as paralysis and amoeba disease were very important factors in beekeeping. Dr. Jamieson urged that further research be undertaken in this country to determine the relative importance of these diseases and methods which might be used in their control. Canada's interest in adult bee diseases was clearly demonstrated when Dr. Jamieson stated that one third of colonies used for honey production in Canada each year are made up from packages shipped in from the United States.

Newly elected officers of the Federation for 1956 were: Joaquin Watkins of Fruita, Colorado, President; Ray R. Reed, Los Angeles, California, Vice President; and Robert Banker of Cannon Falls, Minnesota was reelected Secretary-Treasurer.

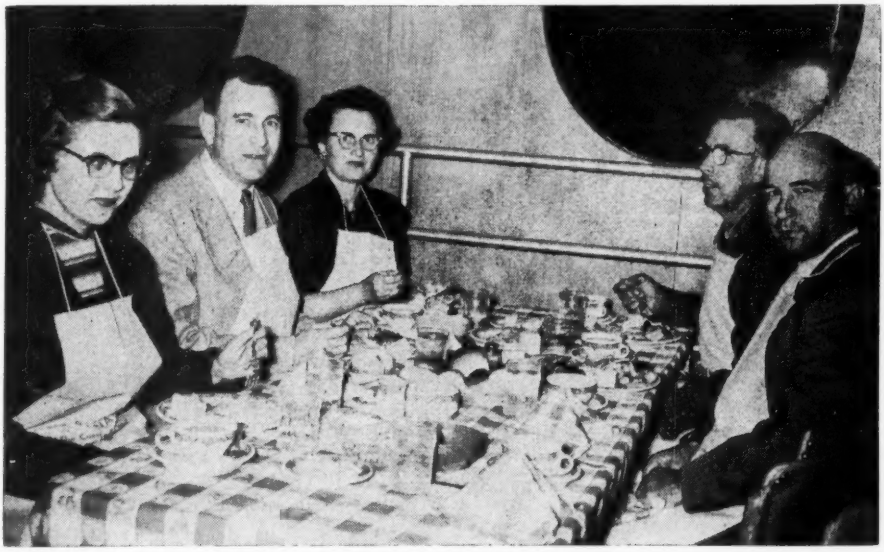
Highlight of the meeting was a report by Clarence Benson, Chairman of the Research Committee on the money recently obtained for research in beekeeping. Benson reported that only $75,000 of the original $100,000 appro-

NEW OFFICERS—Joaquin Watkins, Fruita, Colo., President; Ray R. Reed, Los Angeles, Calif., Vice President; and Robert Banker Cannon Falls, Minn., Secretary-Treasurer.

priated had been received. It was stressed that this was not a temporary, but rather a permanent appropriation increase. Of the new funds $25,000 will be used for research on equipment. Half of the money will be used at Madison, Wisconsin, and half at the USDA laboratory at Tuscon, Arizona. The remaining $50,000 will be used at the various field stations under the direction of Mr. James I. Hambleton for work on pollination, bee breeding, management studies, and investigations on bee diseases.

Hosts to the Federation were the American Bee Breeders' Association and greetings to the Federation were extended through William W. Wicht of Hattiesburg, Mississippi.

Dr. Warren Whitcome, Jr., of the southern USDA Experimental Laboratory, Baton Rouge, Louisiana, spoke about research under way at that station. Dr. Whitcome mentioned that



Left to right: Mrs. H. York, Georgia; Mr. and Mrs. A. I. Root, Ohio; Mr. Charles E. Reed, California, and Mr. S. E. McGregor, Arizona.

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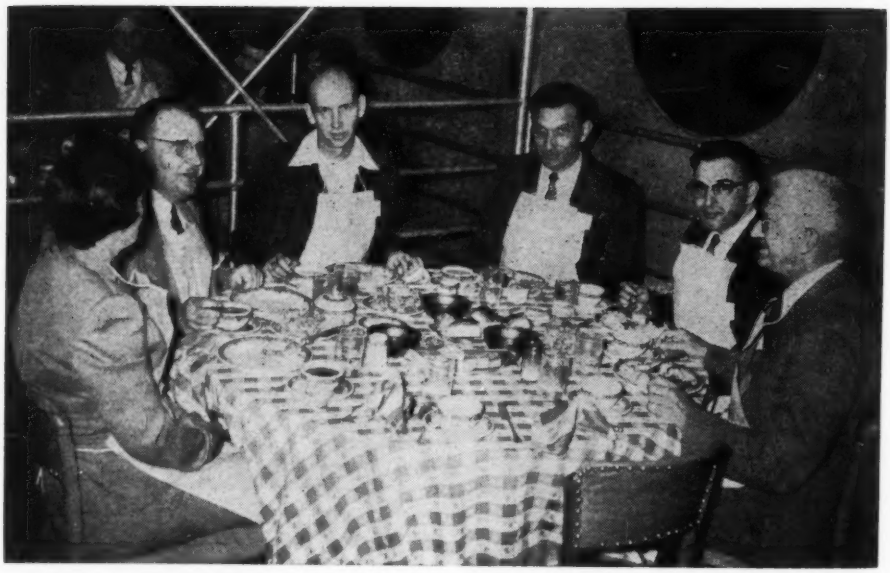


Left to right: Mr. and Mrs. C. M. Scott, Indiana; Mr. Spence, Pennsylvania; Mr. S. Bailey, and Dr. W. Dunham, Ohio, and Dr. R. L. Parker, Kansas.

amongst other phases of the bee breeding research program was that an attempt was being made to find a way to store drone sperm so that it would not be necessary to keep a large number of colonies in reserve. It was stressed that considerable more information on basic bee genetics was needed to further bee breeding programs.

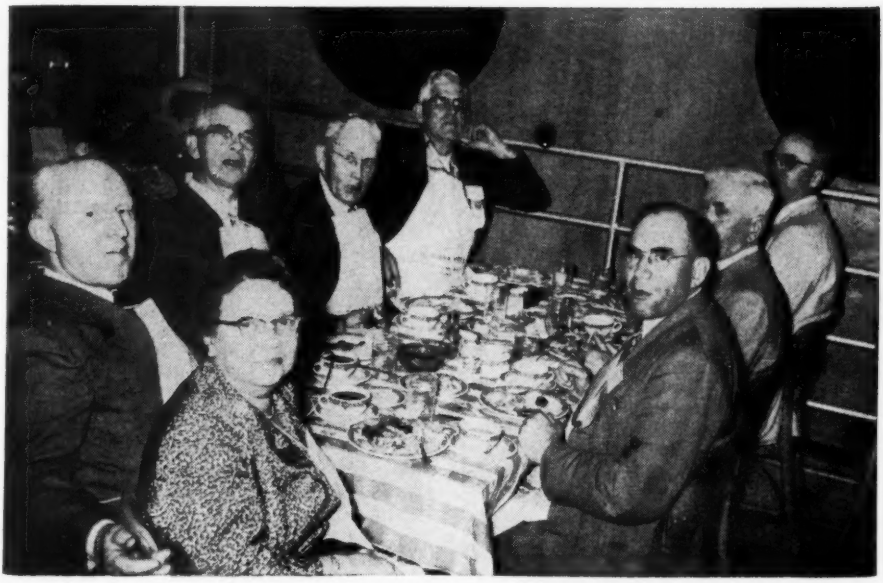
Elected to serve as representatives on the Honey Council, by the directors, were John Holzberlein of Meeker, Colorado, and Henry Hansen of Dakota City, Iowa. Charles Miller of Wyoming and W. F. Huston of California were elected as alternates. The President and Vice President of the Federation also serve on the Honey Council.

Honey was contributed by several beekeepers to be sold and the money to be turned over to the University of Mississippi for research on Nosema. A bushel of oranges donated by Mr. Ralph Wadlow, Palmdale, Florida, was enjoyed by "robber bees" according to Mr. Wadlow in a few humorous remarks at the banquet. Indirectly it netted $66.34 for Nosema research.

Valley Pollination Service was discussed in the general session by Mr. Charles Reed, beekeeper, and Mr. Ward Waterman, seed producer, of Bakersfield, California. Valley Pollination Service now has 70,000 colonies of bees under its direction belonging to many beekeepers. Because these colonies are under the direction of one business manager, seed producers have to deal with only one man and are assured of a sufficient number of colonies to pollinate their crop. This group of beekeepers has been working with seed producers since 1949 and despite the fact that there was an overproduction of alfalfa seed this year it was thought that this cooperative arrangement had proven itself and would continue in effect for years to come. Mr. Waterman stated that he felt that no agricultural industry was so directly dependent upon the beekeeping industry as was the production of certified alfalfa seed.

Much of the activity at Biloxi centered around the success achieved in receiving additional funds for research on beekeeping problems. Incoming President Watkins stressed that he would continue to press for additional federal research funds to aid in studies on honey, pollination, bee diseases, and other problems in beekeeping. Marketing of honey is also a problem which will receive considerable attention from Mr. Watkins and the executive committee. Efforts are now being made

(Continued on page 185)



Front to left: Mr. and Mrs. W. G. Singer, Pennsylvania; Mr. Art Dean, Pennsylvania; Mr. E. M. Miller, Kentucky. Rightside front; Dr. E. J. Anderson, Pennsylvania; John Lis, Illinois, and W. W. Clarke, Jr., Pennsylvania.

Some of the Florida Beekeepers attending the American Beekeeping Federation at Biloxi, Mississippi.—Left to right (bottom row): Mrs. John Demuth, Miss Demuth, Mrs. Jourdain Demuth, Umatilla, Florida; Mrs. Clyde Wadlow, Palmdale, Florida; Mrs. Paul Cutts, Chipley, Florida; Mrs. Millard Coggshall, Minneola, Florida; Top row-left to right: Mr. Brock Demuth, Umatilla, Florida; Mr. H. S. Foster, Gainesville, Florida; Mr. Jourdain Demuth, Umatilla, Florida; Mr. Frank Robinson, Gainesville, Florida; Mr. Karl Knorr, Mount Dora, Florida; Mr. John Haynie, Gainesville, Florida; Mr. Ralph Wadlow, Palmdale, Florida; Mr. Arthur Brady, Winter Park, Florida; Mr. Clyde Wadlow, Palmdale, Florida; Mr. Millard Coggshall, Minneola, Florida; Mr. Paul Cutts, Chipley, Florida; Dr. Roger A. Morse, Gainesville, Florida.

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Just News

IN MEMORIAM. We were very sorry to learn of the death of Mrs. E. J. Dyce, wife of Dr. E. J. Dyce, Professor of Apiculture at Cornell University. No one could have met Mrs. Dyce without being charmed by her friendly and warm personality. We of Gleanings extend our sympathy to Dr. Dyce and family.

The **Berks County Beekeepers' Association** will hold their next meeting on March 8, 1956, at 8 P.M. at the Ontelaumee High School, West Leesport, Pennsylvania, about nine miles north of Reading on Highway 122. —Samuel B. Althouse, Sec.-Treas.

The next meeting of the **Middlesex County Beekeepers' Association (Mass.)** will be held on Saturday, March 31, at the Waltham Field Station. A pot-luck supper will be held at 6:30 p.m., followed by a business meeting.—L. C. Proctor, Secretary.

The **Westchester County Beekeepers' Association** will hold its next meeting at the Odd Fellows Hall, 20 Lockwood Ave., New Rochelle, N. Y., March 18th, at 2:30 P.M. sharp. Refreshments will be served.—Mrs. Alfred Roth, Publicity.

The spring meeting of the **Ohio State Beekeepers' Association** will be held in Room 100 of the B & Z Building, Ohio State University, Columbus, on March 20-21. Guest speakers will be James Hambleton, Division of Bee Culture, Beltsville, Md. and Dr. Chas. Dambach, Director of Ohio Natural Resources Institute.

The **Puget Sound Beekeepers' Association of Washington,** at their annual meeting elected the following officers for 1956: Miss Elizabeth Lewis, President; Halvor Dahl, Vice President; Chester Page, Financial Secretary, and Eugene A. Mueller, Treasurer. The Trustees are: Prof. Geo. S. Smith, Chas. A. Parrish, C. E. Torrence, Chester Page, Dr. Joe Brugman, Capt. L. W. Bundy, Eugene A. Mueller, H. C. Stowe, and George Hundsdorfer.

Worcester County Bee Association will meet March 17, at the Natural History Museum, 21 Cedar St., Worcester, Massachusetts. Speaker will be Dr. Frank R. Shaw from the University of Mass. A pot-luck supper will be served at 6:30.—A. W. Rozenas, Publicity Chairman.

From the "Keystone Farm News & Comment" regarding the recent Farm Show in Harrisburg, Pa. appears the following: "At the booth of the State Beekeepers' Association the totals included 11,000 cups of honey-flavored ice cream, 1000 pounds of honey in jars, 250 combs of honey, 3600 honey candy bars, 150 gift boxes of three jars each in different flavors, 50 pounds of honey peanut brittle, 250 wax candles and 400 chunks of beeswax."

Such a display is bound to promote the interests of our industry in that the products of the hive were brought to the attention of many thousands of visitors each day. Our congratulations to the Pennsylvania Association.

The annual monthly meeting of the **Southern Tier Beekeepers' Association** will be held at 8:00 p.m., March 13 in the Farm Bureau Conference room, City Court House. Every one welcome. A light lunch will be served and a picture shown.—H. B. Webb, Sec.

The **North Carolina State Beekeepers' Association** will hold its annual spring meeting on March 13, in Aberdeen, N. C. For further information, contact J. T. Conner, Jr., Taylor Chemical Company, Aberdeen, N. C. We extend a cordial welcome to all persons interested in beekeeping.—Mrs. A. L. McLean, Sec.-Treas.

The **Midwestern Beekeepers' Association** will meet at 812 Westport Road, Kansas City, Missouri, on March 11, at 2 o'clock. The program under discussion will be "Checking Late Winter Stores and Spring Feeding". Door prize and refreshments.—Mrs. William Brite, Sec.

Bee Colonies More Productive—In 1955 honey production per colony of bees was 47.7 pounds compared with

39.8 pounds in 1954 and the 1949-53 average of 43.7 pounds. The highest yield per colony, 87.4 pounds, was in the West North Central States, and the lowest, 27.2 pounds, in the South Central States. Total honey production last year was 253 million pounds, up 17 per cent from the rather short 1954 crop.

The next annual meeting of the **Southern States Beekeepers' Federation** will be held in Chattanooga, Tennessee, October 10-12, 1956. A good program is being planned and more details will appear later.—Carl M. Teasley, Sec.-Treas.

Pennsylvania Bee Disease Down—"Use of drugs to control foulbrood in bee colonies should not be attempted by inexperienced beekeepers," cautioned George B. Sleesman, entomologist in charge of apiary inspection for the Pennsylvania Department of Agriculture, at the 53rd annual meeting of the Pennsylvania State Beekeepers' Association at the Farm Show.

Sleesman told of the advances made in controlling disease and said that in 1955, following inspection of 7,345 apiaries having a total of 51,862 colonies, only 1.6 per cent were found infected by American foulbrood. In 1953 there was 3.4 per cent infection.

In outlining plans for further apiary inspections in 1956 Sleesman urged the beekeepers, county agents and county bee associations to help in recruiting trained inspectors for the work to be done throughout the state.

Meetings of the **Eastern Missouri Beekeepers' Association** are held in the St. Louis County Courthouse, Clayton, Mo., on the first Tuesday evening of each month at 7:30 P.M. Visiting beekeepers are cordially invited to attend. Officers of the Association are Louis Lueddecke, President; Ross Clenin, Vice President; and Ray Reinhold, Secretary-Treasurer.—Ray Reinhold, Sec.-Treas.

The revised bulletin, "The Beginner Beekeeper in Louisiana," by E. Oertel, Division of Bee Culture, Baton Rouge, La., issued in 1955, contains useful information for beginners and experienced beekeepers as well. Colony management throughout the season, disease control, marketing honey, and other topics are explained. This bulletin is issued and distributed by the Louisiana State Department of Agriculture and Immigration, Baton Rouge, Louisiana.

Donald H. Reid of Hyannis, Mass., a well known beekeeper and bee inspector died recently at the age of 41.

She Wants Honey—Perhaps this will amuse Gleanings readers as it did us. We always use cut-up comb honey on bread at breakfast. Yesterday much of the liquid had run out of the comb so I used that on our three-year-old daughter's bread. Scornfully she handed it back saying, "You only gave me the gravy—I want honey too".—E. D. McIlwee, N. Y.

New Independent Bee Organization Formed in Rhode Island—At a meeting held in January a new independent bee organization was formed in Rhode Island under the title of the **Apicultural Society of Rhode Island.**

This organization will operate as an independent non-profit educational organization with the purpose of encouraging promotional work at the State level in the marketing of honey, disease control through a cooperative program with the State Department of Agriculture, home economic studies and exhibits relative to the use of honey in cooking as part of the society's project on consumer education, 4-H youth projects and collaboration with the various State agricultural organizations in an effort to promote good-will and inform these organizations of the importance of the honey bee in agriculture, and entice young people to take up the art of beekeeping for pleasure and profit.

The society also looks forward to the presentation of visual educational programs on the local TV Stations in an effort to educate the Rhode Island population as to the usefulness of the honeybee for pollination and the goodness of honey as a natural sweet.

The membership would like to take this opportunity to thank Gleanings for the generous distribution of educational materials and the printing of the society's membership cards.—William K. Davis, Publicity.

XUM

Buy and Sell

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate: 18c per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month preceding publication.

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WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. The Hubbard Apiaries, Onsted, Michigan.

IOWA honey, one can or truck loads. Russell D. Smalley, Beaver, Iowa.

CLOVER extracted honey in sixties. Abram Brubaker, Lancaster, Pa., Rt. 2.

SEVERAL tons light clover and amber clover honey in 60's. Rulison Honey Farms, R. D. 2, Amsterdam, N. Y.

MICHIGAN'S FINEST WHITE CLOVER HONEY. New sixties. Fully ripened. No disease. 16c and up. Sample, 20c. John McColl, Tecumseh, Michigan.

FOR SALE—2000 pounds Wisc. No. 1 white clover honey in 60 pound cans. M. M. Johnson, Osseo, Wis.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We can not guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for cash only or on C.O.D. terms except where the buyer has thoroughly established his credit with the seller.

CASH for all types extracted honey. Send sample and best price. Buckeye Honey Co., 3930 No. High St., Columbus 14, Ohio.

CASH FOR BEESWAX. Write as to quantity and we will quote price. Muench-Kreuzer Candle Co., Inc., Syracuse, N. Y.

HONEY WANTED — All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 2613 South Yates Ave., Los Angeles 22, California.

WRITE FOR Shipping tags and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25 per cent saving. Walter T. Kelley Co., Clarkson, Kentucky.

HONEY WANTED, all grades in 60's. Mail samples, advise quantity, best price. A. I. Root Company of Syracuse, 1112-14 E. Erie Blvd.. Syracuse, N. Y.

WANTED — White extracted or comb honey. Send sample. Millersport Honey Company, Millersport, Ohio.

WANTED—White clover honey, carload or truckload. Send sample and lowest price. Cloverdale Honey Co., Fredonia, New York.

BEST CASH DEAL for your honey (any grade) and beeswax. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

WANTED—All grades of extracted honey. Send sample and price. Deer Creek Honey Farms, London, Ohio.

BEESWAX WANTED — Highest prices paid in cash or trade for bee supplies. The A. I. Root Company, Medina, Ohio, Council Bluffs, Iowa. San Antonio, Texas.

WANTED, chunk comb and extracted honey. Mail sample and prices. Stoller Honey Farms, Latty, Ohio.

WANTED all grades extracted honey. Cash, state amount, and grade please. Honeymoon Products Co., 39 E. Henry, River Rouge 18, Michigan.

WANTED—Buckwheat and amber honey. Eastern Food Products, 115 Division Ave., Brookyn, N. Y.

WANTED—Honey in sixty-pound cans, also beeswax, any quantity. L. E. Allen, Tipton, Mich.

WANTED—Sumac honey. Frank Fekel, Almond Road, Vineland, New Jersey.

CASH for Amber and Buckwheat Honey. Best cash price for wax. Hubbard, Onsted, Michigan.

FOR SALE

WRITE FOR CATALOG — Quality Bee Supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies and Comb Foundation. Onsted, Michigan.

THE BIGGEST BEE SUPPLY Catalog published (64 pages) free for the asking. Listing many items not found in other Catalogs. No agents—buy direct and save 20%. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

FOR SALE — New heart cypress 10-frame bottom boards. KD., 10 or more, $1.00 each; 50 or more, 90 cents each; 100 or more, 85 cents each. One nailed up sample postpaid, $1.25. Fred L. Poole, Elizabethtown, Rt. 2, Box 67, No. Car.

FOR SALE — 8-frame Root equipment for 700-colony apiary. Write for details to E. H. Wadleigh, Monte Vista, Colo.

QUEENBEE PAINTING OUTFITS, $1.50 postpaid. Southwick Apiaries, Waban Massachusetts.

FOR SALE—New 200 pound test shipping cartons for five-gallon cans. 12½ each f.o.b. Oakland, Nebraska. R. W. Barnes & Sons.

FOR SALE — Two 30-frame Woodman Radial Extractors, good as new at 25 per cent off of list price. Extractors are at Winner, S. Dak. Schmidt Honey Farms, Winner, S. Dak.

FOR SALE—Bee supplies—some new, some used. Wm. Ramer, Auburn, R. 1, Ind.

Over 100 Dadant, about 50 standard colonies, heavy. Description and price on request. Martin Triplett, Triplett, Mo.

FOR SALE—426 supers of drawn combs, 183 bottom-boards, 164 covers, 158 inner covers, 145 moving screens, 74 excluders, 37 extra empty supers, 1 24-frame Simplicity extractor, 1 large uncapping tank, 19 supers foundation wired in. All standard equipment, $1,250.00. Earl De Long, R. 2, Box 283, Snohomish, Wash.

FOR SALE—200 full-depth supers, with frames, $1.25 each. John Byerly, 41 Main St., Mechanicsburg, Ohio.

80 bodies, new comb, 8-frame, new Stoller spacers, Kelley's wired foundation. Other equipment, bargain. Write. M. Melvin, Celoron, N. Y.

FOR SALE—350 hives bees, standard equipment at Blackfoot, Idaho. J. H. Stoneman, 313 W. 138 St., Hawthorne, Calif.

FOR SALE — 70 colonies bees in 10-frame hives, also 200 supers—half for section comb honey and the remainder for extracted. A small extractor and other equipment and around 1000 pounds extracted honey. Apiary located on Route 53 Morrisdale, Pennsylvania. If interested write Charles Chilcote, Morrisdale, Penna.

FOR SALE—80 disease free colonies in two out-yards near M53 in Lapeer County. All two-story with two extra standard hive bodies and frames. Each colony factory made with inner covers, excluders, feeders. Locations go with bees. Prairie View Honey Co., 12303 12th St., Detroit, Michigan.

FOR SALE—50-200 hives of bees. Also extra supers with drawn combs, excluders etc. Frank Chrisman, Alburnett, Iowa.

FOR SALE—100 colonies of bees four stories high, with winter cases and locations if desired. Homer Van Scoy, Candor, N. Y.

FOR SALE—225 hives of bees in good condition. 8 and 10 frames. Extra supplies, 30-frame extractor. Sell complete. Can be left where they are now. J. D. Knight, ElDorado, Kansas.

120 shallow supers 4¼ x 4¾ equipment. Few bodies, covers, bottoms, queen excluders, 2-frame Root reversible extractor, 12 x 16 pockets. J. W. Watson, 31 Morse St., Coldwater, Mich.

40 colonies of bees. Equipment for 60. Thirty-frame extractor, tanks, etc. Bert Good, Attica, Mich.

SEND OR BRING CAGES. Will supply bees for 75 cents pound. Will sell 100 to 200 ten-frame colonies on good titi tupelo gallberry locations. A. V. Dowling, Valdosta, Ga.

FOR SALE — 150 colonies in central Florida, also 100 cases fancy clover comb honey. Best offer takes them. Wm. March, R. D. 3, Box 65, Mantua, Ohio.

BEES AND QUEENS FOR SALE

We use all possible care in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for a certificate of inspection as a matter of precaution.

Three and four-frame nuclei for sale, one or a truckload. Walker Apiaries, Pharr, Texas.

THE NORMA ROY APIARY Italian bees, 3 pounds with queen, $3.75; 4 pounds with queen, $4.50. Live delivery and a healthy certificate with shipment. Norma E. Roy & Son, Hessmer, Louisiana.

HONEY WANTED

Carloads and less than carloads. Mail sample and best prices in all grades.

C. W. AEPPLER COMPANY

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ITALIAN BEES AND QUEENS

2-lb. pkg. with queen	$2.90
3-lb. pkg. with queen	3.50
4-lb. pkg. with queen	4.25
5-lb. pkg. with queen	5.10
Extra queens	.85
Tested queens	1.50

Live delivery guaranteed and health certificate with each shipment. 10% books your order, balance 10 days before shipping date.

GASPARD BEE CO. Hessmer, La.

J. E. WING & SONS

43 Years Continuous Service

Italian Package Bees and Queens

Our Specialty

Knights Landing, Calif.

ATTENTION PLEASE!

We are booked up on Package Bees and Queens until April 15th. . . .All dates thereafter are open for shipment of queens only.

1-25 ..... $1.00 26-up 85c

Thanks for your patronage!

O. K. Anderson & Son Apiaries

Phone 466 R5

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Carniolan and Caucasian

Start the New Year with young queens and be assured of plenty of bees when honeyflow starts. Carniolans and Caucasians build up rapidly, build white combs and are gentlest of all races of bees. Untested queens $1.30 each air mailed. $2.00 to foreign countries. Discount on quantity. Ready Feb. 15th. Packages later, inquire.

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Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.

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WILLIAMS ITALIAN QUEENS
LARGE LEATHER-COLORED
THREE-BANDED
QUALITY SUPREME
CERTIFICATE WITH EACH SHIPMENT

1 - 9	Postpaid, Airmail	$1.00
10 -99	" "	.95
100-up	" "	.90

DR. WILLIAMS APIARIES
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1956 QUEEN BEES

3-Banded Italians

1-24 ..... $1.20 each
25 or more ..... 1.10 each

Geo. W. Moore
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FRAMEWORK Strain ITALIANS
Genetically bred for six outstanding, desirable factors. All Breeder queens progeny - tested.

	1-24	25-99	100-up
QUEENS	$1.00	$ .95	$ .90
2-lb. pkg. w/q	3.15	3.00	2.90
3-lb. pkg. w/q	4.15	4.00	3.90

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FOR SALE

THE J. W. REITZ & BROS.
Honey Processing and Packing Plant
Doing a prosperous business since 1925. Sale necessary, at a sacrifice, due to death of one of the partners. Plant located in central part of Florida.
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LITTLE'S APIARIES

ONLY source of ORIGINAL John M. Davis ITALIAN QUEENS

1-24	25-99	100-up
$1.25	$1.25	$1.15

Producers of ROYAL JELLY
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ITALIANS — Packages, queens. Martz, Rt. 2, Box 846, Vacaville, California.

CAUCASIANS—2-lb. package, $3.50; 3-lb. package, $4.50. Untested queens, $1.00 each; 100 for $85.00. Lewis & Tillery Bee Company, Rt. 3, Box 90, Greenville, Ala.

FOR SALE—Quality queens. Lynn Williams, Box 5760, Holly Lane, Paradise, California.

PACKAGE BEES—Take a vacation on your express money. Come for your bees; be our guest while here. 1800 hives to shake. Booking orders now. MILLER BROS., SAFFORD, ALA.

FOR SALE—Package bees and queens. Write for prices. L. E. Allen, Tipton, Mich.

LIGHT 3-band and Carniolan bees and queens. 3 pound, $5.00; 5 pound, $7.00. Queens, $1.10, delivered price. Luther Pickett, Efland, N. C.

CARNIOLAN and CAUCASIAN queens, $1.00 each. Shipment starts May 1st. I have the late Albert G. Hann strain of bees. Makes lots of white comb honey. Gentlest of all bees. Roy Waddell, Woodruff, S. C.

ITALIAN queens, $1.00 each. Shipments start May 1st. Cleve Sprouse, Jr., R. 3, Woodruff, S. C.

MISCELLANEOUS

"Adventures in Beekeeping." Illustrated. $2.00. Robert Oglesby, R. R. 1, Middletown, Ohio.

PLAIN or wavy-wired foundation. Beeswax rendered and purchased. Wax Workers, Ithaca, New York.

FOR SALE: Complete set of Gleanings, 1875-1950, except for six volumes. $100. Francis Higgins, Gallaudet College, Washington 2, D. C.

ROYAL JELLY in capsules. Each contains 10 mg. Royal Jelly, 5 mg. Vitamin B, 5 mg. Calcium Pantothenate. Boxes of 30, $1.50 to beekeepers. Retails for $3.00. Prairie View Honey Co., 12303 12th St., Detroit 6, Mich.

ARE YOU going to continue feeding thousands of lazy drones and letting swarms escape this season? You need not, if you equip your hives with Observation Drone and Queen Traps. These are a modern device, simple and practical, and last almost a lifetime. One swarm saved is worth more than the cost of the trap. $3.95 each, postpaid in U.S. Send for free circular. Patent Service Associates, Haverhill, N. H. and 3706 Pleasant St., Cincinnati 27, Ohio.

WANTED

WANTED — 20-frame Root extractor. Earl H. Garrison, Box 68, Anderson, S. C.

WANTED—10-frame dovetail hive bodies, with or without combs. Stan Trescott, Conesus, N. Y.

HELP WANTED

WANTED — Man with some experience queen rearing. Permanent position. Hopkins Honey Farms, Maringouin, La.

Two reliable men to work on bees in South Carolina and New York. Experience not necessary. Start by end of March. Year-around work for good man. Paul Engelhardt, Wallingford, Conn.

WANTED—Man with understanding of bees to sell bee supplies from retail department. The A. I. Root Co., Medina, O.

WANTED apiary and packing plant help. Experience desirable but not essential. Excellent wages, bonus, other advantages. Schultz Honey Farms, Ripon, Wisconsin.

WANTED—A good reliable man for a few months, or a permanent position for the right man. Weaver Apiaries, Navasota, Texas.

HELP WANTED: Experienced Beekeeper. Preferably with some experience in queen rearing. To produce queen bees on Pelee Island. From May 15th to September 15th. Furnished cottage provided. Send application or enquiry to: Professor G. F. Townsend, Apiculture Department, Ontario Agricultural College, Guelph, Ontario, Canada.

WANTED—Experienced beeman, year-round work or seasonal. Possible share basis to right man. Joe Holt, 915 Winslow, Richland, Wash.

HELP WANTED — Year-around job at excellent salary, for capable experienced man who can give satisfaction in large bee business. Also need one inexperienced helper. Furnished rooms for married help. M. E. Ballard, Roxbury, N. Y.

WANTED — Two experienced bee men, year-round work or seasonal. (Reference please.) Jim's Valley Apiaries, Sunnyside, Wash., James E. Bunch.

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Know interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English by the Bhupen Apiaries (Himalayas), Ramgarrh Dist. Naini Tal, U. P. India, or available through them. Subs. Rs9/ or 15 shillings or $2.25 yearly. Sample copy post free for Rs1/8/, or s2/6, or 40 cents (International Money Order). Payment in mint postage stamps of your country accepted.

Archiv fur Bienenkunde, International journal for Bee Culture and beekeeping economics. Founded in the fall of 1918. Oldest economic bee journal in the world. Praised again and again for its decades of independent leadership through many endorsements and advice as a valuable source also for the practice. Classic. Yearly DM 5.50. Any aspiring beekeeping friend will receive a sample copy. Biene-Verglag, Giebelbach, Lindau, Germany.

BEE WORLD, the international journal of the Bee Research Association, published monthly, contains the latest research reports on bees and beekeeping. With **Apicultural Abstracts** it costs $3.00 per annum. Apicultural Abstracts only $1.75 per annum from the Hon. Subscription Secretary, Bee Research Association, 10 Barnett Wood Lane, ASHTEAD, Surrey, England.

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INTERESTED in Angora Goats? Read the Sheep and Goat Raiser, Hotel Cactus, San Angelo, Texas, the only ranch magazine published serving the Angora Goat industry. Subscription $1.00. Sample copy, fifteen cents.

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Our 1956 Prices

Quantity	1 to 9	10-48	49-up
2-lb. w/q	$4.00	$3.75	$3.50
3-lb. w/q	5.00	4.75	4.50
Queens	1.35	1.25	1.15

Book early and be assured of your favorite shipping dates.

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HARPER'S FAMOUS
HIGH QUALITY
ITALIAN QUEENS & PKG. BEES

Quantity	1 to 24	25 & up
2-lb. pkg. w/q	$3.25	$3.00
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4-lb. pkg. w/q	5.20	5.00
5-lb. pkg. w/q	6.15	6.00

QUEENS 1-9 $1.10 ea. 10 & up, $1.00 ea. Bees are very prolific and extra good honey-gatherers. Please send us your order and preferred shipping dates early.

CARLUS T. HARPER
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Quality bees and dependable service for more than 30 years. Write for prices.

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Caucasian QUEENS	1-99	Italians 100-up
2-lb. pkg. w/q	$3.35	$3.25
3-lb. pkg. w/q	4.35	4.25
Queens	1.25	1.15

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Italian QUEENS	1-24	Caucasians 25-99	100-up
2-lb. pkg. w/q	$3.25	$3.10	$3.00
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Nice large queens	1.05	1.00	.95

Only Italian bees in packages.
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Healthy Italian Bees & Queens
Write for 1956 Prices
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IF YOU WANT THE BEST — GET SUE BEE FOUNDATION

SUE BEE FOUNDATION is available in all regular sizes and can be made up in any special size or weight the beekeeper may desire. SUE BEE wired-foundation is made with corrugated hard steel vertical wires to give positive support to the combs. SUE BEE cut-comb and thin surplus foundation is made of light fragrant wax, sure to attract the bees and please the most discriminating buyer. All SUE BEE foundation is made of pure beeswax on most modern machinery.

Remember also, when you need woodenware, that Sioux Honey handles Leahy products. We have a fine stock on hand at all times and if you desire a special style or size we can have it made up for you. Leahy woodenware is a high quality product at a low price.

A recently completed building adjoining our plant in Sioux City, equipped with most modern facilities, provides a rendering service second to none in the United States. Our Rogers, Texas, plant also has a rendering plant to serve producers in that area. Write us for a schedule of rendering charges.

We are always in the market for your beeswax. Regardless of the quantity you may have, we are interested. Just drop us a line and we will quote you the highest market price, either in cash or in exchange for foundation and supplies. Contact us before you sell.

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If you are contemplating using Dadant "Starline" Queens in quantity for the first time, let us have your orders soon as possible so we can prepare to have them available for you. With a combination of the "Best Bees and Queens" plus Fumidil-B feeding, we have faith in your success with our products, under intelligent management, and accordant conditions.

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PRICES

Quantities	"Starline" Queens	"Magnolia State" Ital. Queens	2-lb. Pkgs. W/Qs.	3-lb. Pkgs. W/Qs.
1-24	$1.60	$1.35	$4.00	$5.00
25-99	1.50	1.25	3.75	4.75
100-up	1.40	1.15	3.50	4.50

Package prices quoted are with "Magnolia State" Queens.
Same with "Starline" Hybrid queens, add 25c each.

JENSEN'S APIARIES, MACON, MISSISSIPPI, U.S.A.
"Where Quality is First and Foremost."

BILOXI MEETING

(Continued from page 176)

to secure help from the Agricultural Marketing Service, which has national coverage and appeal to increase honey sales.

The success of the American Beekeeping Federation in obtaining research funds, and in aiding in the establishment of a support price for honey presents a challenge to all beekeepers. The Federation is truly an organization representing all beekeepers as indicated by its membership which represents beekeepers with from one to many thousands of colonies. While the large beekeeper may be more interested in price support than the smaller beekeeper, the efforts of the Federation concerning price support and marketing affects all beekeepers. Research on bee diseases, pollination, and bee breeding may have more direct effect on the small beekeeper but in the long run affects the whole industry.

This last year the Federation increased its membership by more than 200. Its success can be disregarded by no beekeeper and it is important that we all give our support.

Wanted — 600 full-depth supers with drawn combs, or sterilized and honey-house equipment. Write William A. Reinke, Port Hope, Michigan, Box 152.

THE AUSTRALASIAN BEEKEEPER

The senior beekeeping journal of the Southern Hemisphere provides a complete cover of all beekeeping topics in one of the world's largest honey producing countries. Published monthly by Pender Bros. Pty. Ltd. Box 20, P. O., Maitland, 3N, N.S.W., Australia. Subscription by Bank Draft or International M. O. 18/-(approx. $2.15) per year, post free. Sample copy free on request.

ITALIAN PACKAGE BEES AND QUEENS

	1-24	25-99	100 up
2-lb.	$3.25	$3.10	$3.00
3-lb.	4.15	4.05	3.90
Queens	1.15	1.00	.95

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That will stand test for honey-gatherers; Gentle; Prolific. QUEENS BRED FROM HIVES MAKING 300 lbs. OR MORE OF HONEY. Fumagillin fed grafting and queen yards. HEALTH CERTIFICATE with each shipment. All packages F.O.B. Jesup.

Quantity	1-24	25-99	100 up
2-lb. pkg. w/q	$3.75	$3.40	$3.00
3-lb. pkg. w/q	4.75	4.50	4.00
4-lb. pkg. w/q	5.75	5.50	5.00
5-lb. pkg. w/q	6.75	6.50	6.00
QUEENS MATED & LAYING DEL.	1.25	1.15	1.00
TESTED QUEENS	2.00 del. any amount		

PROMPT LIVE DELIVERY GUARANTEED. Place orders now. Early orders carry priority.

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ITALIAN PACKAGE BEES and QUEENS

We ship pure worker bees by mail, express, or truck. We guarantee live arrival. We ship you the package with the queen introduced or regular caged in the package, whichever you like.

1956 Prices — Each with a Young Laying Queen

Each	2-Pound	3-Pound	4-Pound	5-Pound
1 to 11	$4.00	$5.00	$6.00	$7.00
12 to 29	3.80	4.75	5.70	6.65
30 or more	3.60	4.50	5.40	6.30

Untested Queens, each, $1.35; Tested queens, each $2.00
If queenless bees are wanted, deduct $1.35 from the package price.
JACKSON APIARIES P.O. Box 58 FUNSTON, GEORGIA U.S.A.

All 1955 Orders Filled Without Much Delay
Let Us Fill Your 1956 Orders.

2-lb. packages with queens	$3.00 any number
3-lb. packages with queens	4.00 any number
Untested queens	1.00 any number
Tested queens	1.50 any number
Larger packages, add	1.00 per pound

Delivered prices on request. Above prices are F.O.B. except queens which are delivered by mail. Italians only. Remember our 100% Satisfaction always good. If you need more information, write us please.

MERRILL BEE COMPANY P.O. Box 115, State Line, Miss.

CAUCASIAN or ITALIAN
Package Bees and Queens for 1956

Gentle bees, less swarming, good producers, health certificate and live arrival guaranteed are just a few things you get when your requirements are sent to me. No extra charges on orders booked in advance.

	1-25	25-50	50-100
2-lb. pkg. w/q	$3.70	$3.45	$3.20
3-lb. pkg. w/q	4.60	4.30	4.00
4-lb. pkg. w/q	5.50	5.15	4.80
5-lb. pkg. w/q	6.40	6.00	5.60
Queens	1.20	1.10	1.00

FARRIS HOMAN
SHANNON, MISS.

Booking orders now. Over 30 years a shipper. Send for Free Circulars.

BLUE BONNET APIARIES
Weslaco, Texas

WHAT MAKES A QUEEN?

(Continued from page 138)

had four full frames of brood and was still laying well. Thus it has been demonstrated that the natural instincts and normal functions of the queen honeybee can still be preserved in "incubator queens".

The rearing of queens under controlled conditions in the laboratory has opened up a new approach to the study of caste differentiation in honeybees. However the basic question, "what makes a queen?" still remains unanswered.

PACKAGE BEES AND QUEENS
Three-banded Italians

	1 to 50	50 up
Queens	$1.10	$1.00
2-lb. pkg.	3.50	3.25
3-lb. pkg.	4.50	4.25

Live delivery guaranteed.
AUTAUGA BEE FARM
Owned and Operated by
J. H. Moody and W. L. Strength
Prattville, Ala.

Protect Your Future. Buy Your Savings Bonds Now.

DADANT'S NEW IMPROVED STARLINE HYBRIDS and GARON'S THREE-BANDED ITALIANS

Share with others in the present favorable honey prices. Meet good prices with TOP PRODUCTION. A good way to accomplish this is to stock with NEW IMPROVED DADANT STARLINE HYBRIDS and GARON'S THREE-BANDED ITALIAN Package Bees and Queens.

Reg. U.S. Pat. Off.

	QUEENS		Package Bees With Queens		
	Italians	Starlines	2-lbs.	3-lbs.	4-lbs.
1 -24	$1.25	$1.60	$3.65	$4.60	$5.55
25 -99	1.20	1.50	3.55	4.50	5.45
100-up	1.15	1.40	3.45	4.40	5.35

— Add 25c per package for Starline Hybrid Queens —

Queens Clipped and/or marked, when desired, without extra cost.

GARON BEE COMPANY **Donaldsonville, La.**

PACKAGE BEES & QUEENS — "ITALIANS"

Wilbanks offers you tested stock proven for honey-producing ability and easy handling. Satisfied customers through the years assure you of the greatest value here.

— PRICES —	1-9	10-49	50-up
2-lb. pkg. with young laying queen	$4.00	$3.75	$3.50
3-lb. pkg. with young laying queen	5.00	4.75	4.50
4-lb. pkg. with young laying queen	6.00	5.75	5.50
Extra Queens	1.25	1.15	1.10

Shipments by Express, Parcel Post or your Truck.
Queen Yards and Package Bees Fed Fumidil-B.

Quality Does Not Cost — It Pays

THE WILBANKS APIARIES **Claxton, Georgia**

YORK'S PACKAGE BEES AND QUEENS

The Preference of Leading Honey Producers

Your Choice of

DADANT'S Improved STARLINES or YORK'S Quality Bred ITALIANS

Fumidil B fed queen grafting yards, queen mating yards, and package bees at no extra cost.

PRICES WITH ITALIAN QUEENS

Quantity	1-24	25-99	100-up
2-lb. pkg.	$4.00	$3.75	$3.50
3-lb. pkg.	5.00	4.75	4.50
4-lb. pkg.	6.00	5.75	5.50
5-lb. pkg.	7.00	6.75	6.50
Queens	1.35	1.25	1.15

Reg. U.S. Pat. Off.

FOR DADANT'S IMPROVED STARLINES, add 25c each additional
FOR TESTED QUEENS, add $1.00 each additional
FOR QUEENLESS PACKAGES, deduct $1.00 each

FREE OFFER: On orders for Italian queens or packages of from 10 to 100, we will substitute 10% of the queens with Starlines at no additional charge if requested. Offer subject to availability.

Shipments are made FOB Jesup by express, parcel post, or your truck. Bees are certified bees from our own apiaries state registered and state inspected. If convenient small orders cash, and larger orders $1.00 deposit per package with balance payable two weeks prior to shipment.

YORK BEE COMPANY **JESUP, GEORGIA**
(The Universal Apiaries)
P. O. Box 300 **412 W. Orange St.** **Phones: 3522, 3320**

XUM

THREE-BANDED ITALIAN PACKAGE BEES AND QUEENS

Shipped Anywhere in United States and Canada

1956 Prices F.O.B. Hampton, S. C.	Queens (each)	2-lb. & Queen	3-lb. & Queen	4-lb. & Queen	5-lb. & Queen
1 -24 pkgs.	$1.15	$3.75	$4.75	$5.75	$6.75
25 -99 pkgs.	1.05	3.50	4.50	5.50	6.50
100-up pkgs.	1.00	3.25	4.25	5.25	6.25

(For Queenless Packages Deduct Price of Queen)

Guaranteed safe arrival.
Health certificate with each shipment.
Queens clipped and painted if desired.
Shipper rated in Dun & Bradstreet.

TERMS: One-third with order, balance 10 days before shipment.

H. C. BRUNSON

P.O. Box 188 HAMPTON, SOUTH CAROLINA Phones: 2161 or 4581

THREE-BANDED ITALIAN BEES AND QUEENS

Extra good workers and very gentle to handle. Dadant's Starline Hybrids bred for the best of honey production.

STARLINE QUEENS			OUR REGULAR STRAIN		
1-25	25-100	100-up	1-25	25-100	100-up
$1.60	$1.50	$1.40	$1.30	$1.20	$1.10

Shipment starts any time after Feb. 1st. Write for package bee prices.

ALAMANCE BEE COMPANY La Belle, Fla.

Brazos Valley Apiaries
Cameron, Texas

Italian

Brazos Valley Apiaries
Cameron, Texas

Package Bees and Queens

By Express or Parcel Post. Extensive experience in loading out trucks.

	1 pkg.	2 or more
2-lb. bees with young queen	$3.75 each	$3.50 each
3-lb. bees with young queen	4.75 each	4.50 each

Nearing a half century in the same place, same business, under the same name, is my record. My motto: I expect to do business with you again.

H. E. Graham Cameron, Texas

MOUNTAIN GRAY CAUCASIANS

Personally raised. Gentle good workers; winter well. Queens $1.25 each.

ELBERT S. CHILDS
201 Garden Ave. Knoxville 18, Tenn.

Why Not Buy the Best QUEENS!

Italians

1-25	25-100	100 up
$1.25	$1.15	$1.00

Ready to ship April 1st.
Guaranteed to please.

UNITED APIARIES
Box 276, Roxton, Texas

31 Years Experience as Queen Breeders

LET'S TALK ABOUT HONEY PLANTS

(Continued from page 173)

fail, although rain is sometimes bad for the blooms.

North Carolina. The largest surplus from a single colony is reported by George E. Curtis of Graham, who obtained 300 pounds from lowbush gallberry. He also gets up to 100 pounds from highbush gallberry. He adds that the latter blooms from April 28 to May 10, whereas the former blooms later, May 20 to June 10.

Hawthorn (Crataegus) is a rather common thorny tree in many eastern states, but although all agree that honey bees visit the flowers in large numbers, there are a few reports of a surplus. Mr. Francis C. Gales of Lancaster, N. Y., writes me that his bees stored 45 pounds of honey from hawthorn.

You'll get
BETTER BEES & QUEENS
From these members of
The American Bee Breeders' Ass'n.

Alamance Bee Company — La Belle, Fla. and Graham, N. C.
Bessonet Bee Company — Donaldsonville, La.
E. J. Bordelon Apiaries — Moreauville, La.
J. M. Cutts & Sons — Chipley, Fla.
Jackson Apiaries — P. O. Box 58 — Funston, Ga.
Jensen's Apiaries — Macon, Miss.
Little's Apiaries — P. O. Box 122 — Shelbyville, Tenn.
W. E. Plant — Rt. 2 — Hattiesburg, Miss.
The Puett Company — Hahira, Ga.
Rossman Apiaries — P. O. Box 133 — Moultrie, Ga.
Stover Apiaries — Mayhew, Miss.
Sunkist Bee Co. — Convent, La.
Weaver Apiaries — Navasota, Texas
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Wilbanks Apiaries — Claxton, Ga.
York Bee Company — Box 300 — Jesup, Ga.

"HIGH QUALITY IS **ALWAYS** A BARGAIN"

PACKAGE BEES ITALIAN QUEENS
Good Producers — Gentle
You will like them. Good service.
A. R. BANTA Los Molinos, Calif.

LIVE AND LEARN

(Continued from page 168)

for certain that they are going to do or not do something is just sticking his neck out. True enough, they do follow a regular pattern of behavior, but there are always some rugged individualists which seem to take an unholy delight in proving that the expert beekeeper don't know what he is talking about.

"The Australian Bee Journal"
Published by the Victorian Apiarists' Association at the beginning of each month.
Subscription 10/-per annum plus 2/6 postage to overseas countries.
Box 167, Rainbow, Victoria, Australia

BETTER BRED QUEENS
THREE-BANDED ITALIANS

	Queens	2-lb. w/q	3-lb. w/q
1-24	$1.35	$4.00	$5.00
25-up	1.15	3.50	4.50

Please book orders early as possible to get best shipping date.
CALVERT APIARIES Calvert, Ala.

The Picture Bee Magazine
If you are taking time to read, why not read the best? Condensed to save you time. Illustrated to give you pleasure.
Modern Beekeeping
Clarkson, Kentucky

U. S. Savings Bonds come in all sizes . . . . . and grow bigger every year.

XUM

PACKAGE BEES "GULF BREEZE" ITALIAN QUEENS

Manitoba beekeeper reports many colonies producing 400 pounds, Illinois reports record production of premium comb honey and all with "GULF BREEZE" stock. Book your order NOW with us at the following prices:

QUANTITY	QUEENS	2-lb. Pkg. W/Q	3-lb. Pkg. W/Q	4-lb. Pkg. W/Q
1-9	$1.35	$4.00	$5.00	$6.00
10-49	1.25	3.75	4.75	5.75
50-up	1.15	3.50	4.50	5.50

BESSONET BEE COMPANY **Donaldsonville, La.**

BEES QUEENS

The rearing of good Italian queens and bees is our only business.
46 Years' Experience
A Young Laying Queen with Each Package

	1 to 9	10-48	49 or more
2-lb. pkg.	$4.00	$3.75	$3.50
3-lb. pkg.	5.00	4.75	4.50
Queens	1.35	1.25	1.15

For larger packages, add $1.00 per pound. Young laying queens. Packages are full weight, young bees. Health certificate with each shipment.

PROMPT SERVICE

W. E. PLANT
Hattiesburg, Mississippi

QUALITY BEES DEPENDABLE SERVICE

We are not the biggest shippers of package bees but we rank with the best in quality and service. Full weight, safe arrival, health certificate, and satisfaction.

34 Years as Shippers

— PRICES —	1-11	12-100
2-lb. Pkg. with queen	$3.75	$3.50
3-lb. Pkg. with queen	4.75	4.50
Untested queens	1.10	1.00
Tested queens	2.00	1.75

Package bees are shipped express F.O.B. If wanted shipped parcel post, add postage.

NORMAN BROS. APIARIES
Ramer, Ala.

HOLLOPETER'S ITALIAN QUEENS

Young Laying Queens .....$1.00 each
Return Mail

WHITE PINE BEE FARMS
Box 810 ROCKTON, PA.

TULIP POPLAR FLOW

(Continued from page 146)

many buyers outside of the area select honey on color alone and will usually discriminate against the darker honey. As much as we, as honey producers, think that flavors rather than color should be stressed, we still have to sell our honey to the general public who have definite opinions already formed. It is wise to keep all possible colors and flavors separate in order to meet the demands of the public. True, most honey is blended and even though it is easier to let the bees do the job, the packer can do a better job of controlling both color and flavor, if he begins with pure flavors.

In summarization, the most important items for tulip-poplar production are as follows: (1) Add supers before the flow begins, to reduce swarming; (2) plan to produce extracted honey, as well as comb honey to keep the bees in best condition; (3) use one and one-half or two-story hives for wintering so there will be more space for brood rearing and storage of honey and pollen; and (4) feed in the spring to build strong colonies early.

Actually management for the tulip-poplar flow follows much the same procedure as any honey flow. The chief difference lies in the fact that tulip is the first major crop of the season and few beekeepers have their colonies ready for production.

SEARCH FOR PERFECT COMBS

(Continued from page 159)

noticed that on a perfectly drawn comb having worker cells from top bar to bottom bar, bees did not seem to tear out passageways along the bottom of the comb.

Inadvertently the next season, I transferred one of these colonies to a conventional bottom board and, surprise, the comb was still not chewed. Surprise added to surprise. That year found several colonies situated on "warm way" bottoms chewing the passageways that I had learned to abhor.

What was this proving? As far as I could see, certain strains of bees chew passageways in the bottom edge of the combs under certain conditions.

With extracting that same year, I came across some of these combs. In some cases there was a quarter-inch space between the comb and the entire length of the bottom bar, but the radial extractor didn't damage this incompletely supported comb, and though the looks of it annoyed me, it still held ample honey. If the honey flow had been greater, this "once-a-brood comb" would have been completely filled from top bar to bottom while it was in the super.

I got to wondering what my annoyance was. After all, if the same comb had been in a brood nest, no brood space would have been lost, since this small area would have been stored with pollen.

I still do not know exactly why bees do this chewing. Is it for ventilation? For passageways? Or, for sheer perversity? It no longer gives me the feeling it did 20 years ago when I was striving for perfect combs. In fact, as I proceed through the years of beekeeping, I realize that most of the perfection that is credited to bees and their workings is mostly in the minds of men.

The New Zealand Beekeeper

The Quarterly Magazine of the National Beekeepers' Association of New Zealand. Better Beekeeping—Better Marketing. Subscription, 8 shillings per year, payable to

THE GENERAL SECRETARY
Box 19 Foxton, New Zealand

Make 1956 Prosperous
with
Package Bees

Replace all winter loss and make increase with proven stock and dependable service.

Prices with regular queens

	2 lb.	3 lb.
1-24	$4.00 ea.	$5.00 ea.
25-99	3.75 ea.	4.75 ea.
100 or more	3.50 ea.	4.50 ea.

For Island Hybrid Queens add 25c each.

"They Produce"

Night shipment from junction of two main rail lines.

Rossman Apiaries

P. O. Box 133
Moultrie, Ga.

DARK ITALIANS
As GOOD As the Best

	Queens	2-lb. pkg.	3-lb. pkg.
1 to 10	$1.35	$4.00	$5.00
11 to 50	1.25	3.75	4.75
51 and up	1.15	3.50	4.50

Place your order early. The demand for good queens and packages will be larger than the supply.

WEAVER APIARIES
Navasota, Texas

Quality Bred Italian Queens

Breeders selected from our Michigan Apiaries for High Production and Hardiness.

Qns. through Feb. and Mar. $1.25 ea.
" " April and May, 1.00 ea.
All queens shipped Air Mail.

WALTER D. LEVERETTE APIARIES
P.O. Box 364 Ft. Pierce, Fla.

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Look for this Sign
When you Want
QUALITY AT LOW COST

Trade Mk. Reg.
U. S. Pat. Off.

KELLEY — "The Bee Man"

BEES and QUEENS

Three-banded Italian bees and KELLEY'S ISLAND improved hybrid queens direct from our own farm. Shipments start April 1st, express or parcel post shipment. Thousands of extra queens.

	Kelley Island Queens	2-lb. bees & K. I. queen	3-lb. bees & K. I. queen
1-24	$1.25 air mail	$3.50	$4.50
25-99	1.15 air mail	3.25	4.25
100-up	1.05 air mail	3.00	4.00

THE WALTER T. KELLEY CO. Clarkson, Ky.

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